The Chemical Age

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NOTICES.—All communications relating to editorial matter should be addressed to the Editor, who will be pleased to consider articles or contributions dealing with modern chemical developments or suggestions bearing upon the advancement of the chemical industry in this country. Communications relating to advertisements or general matters should be addressed to the Manager.

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Inter-Colonial Trade

THE fact that the present issue of THE CHEMICAL AGE—the annual Colonial Number—will find its way to readers in all parts of the Empire calls for a reminder of what we have said in the past concerning the need for manufacturers and traders to keep an alert eye on scientific and commercial developments in the British Colonies. Though nearly six years have elapsed since the termination of the war we are faced by the fact that the Continent of Europe as a market for our manufactured goods is still a long way distant from those normal, perhaps easy-going, conditions which existed prior to 1914; and it is clear, as Sir Eric Geddes has said, that we now need some re-orientation of our commercial policy, the obvious direction for this being the cultivation of our own inheritance. No one would, of course, attempt to deny the potentialities of the European markets; but we cannot in this country afford to mark time while those countries are going through the tedious process of putting their houses in order. The obvious step is to take advantage of the almost unlimited field for expansion which is available within the Empire, to make sure of definite trading links where they are known to exist, and to endeavour to bring ourselves to the state of being able to regard the purely foreign markets as helpful and attractive reserve outlets which, through steady and continuous improvement, will stand us in good stead when our productive capacity outgrows what our Empire is capable of absorbing.

It is now almost generally recognised that the possibility of a self-supporting Empire is quite realisable, for so far as Great Britain is concerned the necessary productive power already exists, and if the same does not as yet apply to the overseas Dominions we at home are in a position to aid development by making every effort to ensure an increase in our own consumption of their products. We have frequently alluded to the fact that Colonial firms are strongly disposed at the present time to deal with the mother country rather than to seek business with competitive nations, and it rests with our own manufacturers to see that the particular goods which are wanted are produced. If our Colonial trade is to develop and prosper, however, it must necessarily be reciprocal, and the present year (when so many representative buyers and sellers from overseas are visiting the mother country) undoubtedly provides an opportunity for the exchange of ideas such as may not occur again for some long time to come.

Possibilities in Electro-Chemistry

A CORRESPONDENT who was interested in the remarks we made in these columns last week in connection with the electrolytic production of caustic soda points out that although the applications of electricity play an important part in many of the present-day processes of chemical industry, yet there is no doubt that we must expect electro-chemistry to achieve still further technical significance, even in certain fields in which it has now scarcely a footing. The decomposition of inorganic compounds, the refining and winning of metals, and the electrolytic production of oxygen and hydrogen have reached a state of good commercial efficiency in many cases, and, in general, future developments lie rather in the perfection of the plant employed, the raising of the energy efficiency, and the reduction of secondary reactions which affect the purity of the products than in any very startling innovations. Improvement, even if it is not rapid, is progressive. On the other hand, the production of organic compounds by electrolysis awaits development in many directions, for although much valuable work (chiefly experimental) has been carried out in this field, yet its translation into successful commercial practice has not achieved any great measure of success except in a few cases which can be regarded as very isolated compared with the enormous possibilities.

The direct electrolysis of organic compounds with the evolution of anodic and cathodic products appears

to offer almost insuperable difficulties owing to the highly complicated nature of the reactions, but it does not follow that further prolonged and exhaustive research will not produce more satisfactory results. Electro-reduction of organic compounds gives greater promise of success, and in a few cases commercially operated plants have been evolved. Oxidation, halogenation, and substitution processes, however, introduce greater difficulties, and the development of our knowledge concerning them and their practical application in industry will probably be slower. It is a great mistake to regard electro-organic methods as only of minor importance, and it is incumbent on this country to encourage research in this highly important and interesting direction. The current discussions on the development of electric power afford an opportunity for considering the possibilities of electro-chemistry; and while it is, perhaps, optimistic to expect the displacement of purely chemical methods in the organic world (analagous to, say, electrolytic alkali), yet there is every reason to believe that, given sufficient research, results of far-reaching importance will be achieved.

The Multiplicity of Societies

Sir Arthur Duckham, in his presidential address before the Institution of Chemical Engineers, raised the question of the increasing number of technical societies. This was in a way a personal apology for his acting as president to yet another technical body, but, as he pointed out, the Institution of Chemical Engineers has undoubtedly justified its existence during its first year by the amount of interest shown at its meetings. The Institution is really a highly specialised technical association, yet such is the special nature of the callings of most technical men, that it is just these bodies which show the greatest strength, and others of a more general appeal with a large membership (Sir Arthur mentioned the Institution of Civil Engineers), that are wondering how they may increase the interest in their meetings. On the other hand, a given man will find that he is interested in quite a number of societies. Thus the industrial chemist will find important meetings under the auspices of the Institute of Chemistry, the Society of Chemical Industry, the Chemical Engineering Group, or the Institution of Chemical Engineers, and possibly the Faraday Society, the Chemical Society, and many others, such as the Oil and Colour Chemists' Association or the Society of Glass Technologists. A similar state of things exists for the gas engineer, the power plant specialist, and so on, and it is obviously impossible for individuals to be members of so many associations. The suggestion made by Sir Arthur Duckham, with which we are in entire agreement, is that it is time that a committee was appointed of delegates from the various bodies, with a view to devising some affiliation scheme which would carry reciprocity of membership, and eventually centralisation of offices in a common building. This, of course, has already been considered for the various chemical bodies in the Chemistry House schemes, but the present suggestion is on a broader basis. Under such a scheme a member of the Chemical Engineering Group, to take a particular case, would be entitled to attend any meeting of the Institution of Mechanical Engineers in which he was interested, and *vice versa*. There would be many difficulties in the way, doubtless, but with such obvious advantages in view they should not be insurmountable.

Iodine and Potash from Seaweed

It will be recalled that some two or three years ago the Fuel Research Board, then under the direction of Sir George Beilby, undertook a number of experiments in connection with the carbonisation of seaweed in the vertical retorts at the East Greenwich station. When speaking of the utilisation of seaweed it must be borne in mind that in the nineteenth century the harvesting of the weed for the recovery of chemical products afforded not a little employment, and should a scientific and economical method of carbonisation be evolved, it might be possible to revivify an industry which would do much in the way of providing employment in areas where the livelihood of the labouring classes is precarious. The most important property of seaweed is its ability to yield iodine and alkali salts, and there must be few who have not some recollection of the old process of kelp-burning, which, in spite of all precautions, resulted in the loss of a heavy proportion of the available products. The work which has been carried out at the Fuel Research Station, and details of which are contained in a report just issued, was in the nature of a further endeavour to provide data which might be useful in devising a self-contained system of carbonisation whereby the kelp weeds could be dealt with in such a way that there would be no loss of iodine, and that the gaseous products might be utilised for firing the necessary retorts.

After a thorough examination had been carried out on a laboratory assay scale, use was made of the setting of horizontal retorts designed for the low-temperature carbonisation of coal, a charge of seaweed being carbonised in one retort in such a way that all the liquid products could be carefully collected. It is pointed out that carbonising plant for the treatment of seaweed depends largely for its success on the possibility of making the process thermally self-contained, for the practicability of obtaining a cheap local fuel is remote in those districts where peat is available. The main question is, therefore, whether or not the available heat units in the by-products would, if properly applied, be sufficient to carry on the process. The problem is by no means simple, for the design of a suitable retort is complicated by two outstanding difficulties—first, the large amount of water which must necessarily be evaporated from the raw substance, and secondly, the comparatively low bulk density of even the dried weed. However, the Fuel Research Board workers seem to have sound ideas for overcoming these and other drawbacks, and they are of the opinion that the therms available in the gas would probably be sufficient for carbonisation provided that fairly dry weed could be guaranteed. It is interesting to note that the therms of gas available for heating purposes amounted to 15·1 per ton of dried seaweed, but this could be augmented by another 46·3 therms available in the charcoal. The main point of importance which emerges from the report is that in the opinion of the Board the process could be made thermally self-contained, a conclusion which should possibly be sufficient to warrant developments on a commercial scale.

Synthetic Methane Difficulties

FOR more than twenty years the synthesis of methane from carbon monoxide or carbon dioxide and hydrogen has proved a fascinating but elusive problem. Credit for the genesis of the idea belongs to Sabatier and his co-worker Senderens, but the enormous gap which is so often found between the laboratory and plant operating on a commercial scale has continued to baffle not only the original workers but those who in more recent years have realised the industrial significance of the reaction. Only some nine months ago we drew attention in these columns to the fact that two American workers, Messrs. R. T. Haslam and H. O. Forrest, were attempting to get nearer a solution of the problem by conducting a thorough experimental research into the formation of methane in this way when nickel is used as a catalyst; and now, through the enterprise of Dr. Charles Carpenter, we are given a most concise statement of the conclusions which have been arrived at as a result of a comprehensive study of the reactions concerned which has been conducted by the research staff of the great undertaking over which he presides. As would be expected, the results obtained have rendered possible a much clearer conception of the technical possibilities of the process; but the impression gained is that even were the most practicable of the methods suggested put into operation on a large scale it would be extremely liable to dislocation and almost prohibitive from the point of view of cost.

The two raw materials which have been suggested as starting points are blue water gas and ordinary coal gas. Of these, water gas must now be more or less ruled out, for not only would it be economically, if not practically, impossible to remove the sulphur compounds which act as catalyst poisons if present to so small an extent as one part of sulphur per million parts of gas, but in water gas as commonly produced it would be necessary to adjust the carbon monoxide-hydrogen ratio. If dealing with coal gas the most serious stumbling-block, apart from the preliminary removal of the sulphur compounds, would be the necessity for eliminating partially the valuable unsaturated hydrocarbons, while a further loss would be incurred from the conversion of part of the carbon monoxide to carbon dioxide, a useless diluent. To sum up, this new investigation should at least make it clear that there is little benefit to be derived from pursuing the matter further, and Dr. Carpenter's staff of chemists has performed a notable service in avoiding the duplication of research and the further expenditure of time on what looks like an unprofitable quest.

Ammonia Stills.

AN important addition to the series of chemical engineering volumes published by Ernest Benn, Ltd., is the new work by Mr. P. Parrish, A.I.C., M.I.Chem.E., on *The Design and Working of Ammonia Stills* (pp. 300. 40s. net). We hope in due course to review this volume in some detail; for the moment it may suffice to quote the opinion of Dr. Carpenter, President of the South Metropolitan Gas Company, in the "Foreword" he has written for the book. "We do not mind," Dr. Carpenter writes, "the ruggedness of the writing nor the absence of polish in the phrasing. We turn to his pages, not for inspiration, nor for visions, but for facts and for figures, and we are provided with the very things we seek. We may be sure that when Mr. Parrish gives us a working drawing of a still we can send it straight away to the manufacturer, certain that when constructed and erected it will function in the manner expected of it. . . . He has placed, through his book, his wide knowledge at the service of all seeking information upon the subject of which he treats, and has given particulars of yields and costs which must prove of great utility to all engaged in the conduct of like operations." So exacting a judge as Dr. Carpenter does not lightly commit himself to terms such as these, and the author may be excused for feeling some pride in this tribute from his distinguished chief. As Mr. Parrish points out, it is impossible to prepare a book of this character without incorporating the ideas and principles intuitively acquired as a result of association with the officials and staff of the company with which one is connected, and he warmly acknowledges the kindly help and encouragement in the preparation of the book received both from Dr. Carpenter and from Mr. E. V. Evans, the chief chemist and products manager to the company.

Points from Our News Pages

A special article appears dealing with the chemical needs of Australia and New Zealand, South Africa and India, which are the Dominions principally dependent on outside sources of supply (p. 82).

A further note on "Chemists in Industry" is contributed by Mr. Norman Sheldon (p. 85).

The principal Dominion and Colonial Exhibits at Wembley are reviewed, with special reference to their chemical displays (p. 87).

An account is given of the Annual General Meeting of the Association of British Chemical Manufacturers, which was followed by a dinner at Wembley and an inspection of the Chemical Section at the Exhibition (p. 88)

At the Annual Meeting of the Colour Users' Association, suggestions were made with a view to securing a reduction in the price of dyestuffs (p. 90).

Among the patents recorded in our columns, Brunner, Mond and Co. have applied for protection of a method for purifying nitrogen and hydrogen for ammonia synthesis by passing the gases through anhydrous liquid ammonia (p. 101).

The London market shows signs of improvement and the outlook is more promising.

Books Received

THE DIRECTORY OF THE QUARRIES OF GREAT BRITAIN AND IRELAND. Compiled by S. McPherson and R. Rees Williams. Carnarvon: The Quarrying Publicity Bureau. Pp. 120.

THE KINETIC THEORY OF GASES. By Eugene Bloch. London: Methuen and Co., Ltd. Pp. 178. 7s.

DE LA CONSISTANCE DES VERNIS ET AUTRE FLUIDES AU POINT DE VUE DE LEURS APPLICATIONS INDUSTRIELLES. Par A.-R. Matthis. Paris: Dunod. Pp. 78.

THE DESIGN AND WORKING OF AMMONIA STILLS. By P. Parrish. London: Ernest Benn, Ltd. Pp. 300. 40s.

WATERPROOFING TEXTILE FABRICS. By Herbert P. Pearson. New York: The Chemical Catalog Co., Inc. Pp. 112. $3.00.

MONOGRAPHS ON BIOCHEMISTRY.—THE CARBOHYDRATES AND THE GLUCOSIDES. By Dr. E. Frankland Armstrong. London: Longmans, Green and Co. Pp. 294. 16s.

The Calendar

Aug. 6–13	British Association for the Advancement of Science Meeting	Toronto
Sept 4–5	Iron and Steel Institute Autumn Meeting	British Empire Exhibition, Wembley
8–11	Institute of Metals	London

Chemical Markets in British Dominions

A Survey of their Requirements

In the following specially contributed article the chemical requirements of Australia, New Zealand, South Africa and British India are dealt with, these being the Dominions importing the greater proportion of their chemical requirements, and so offering the most favourable market to British exporters.

THE salient points which attract attention in any consideration of the marketing of British manufactured chemicals in Empire trade centres are: (1) The extraordinary proportions of their requirements which are purchased from this country in all cases except that of Canada; and (2) the comparative smallness of our supplies to these areas when related to our sales to other countries. Taken in conjunction with the soundness of currency values, with no undue exchange variations to hinder business, these two points augur well for the gradual expansion of our supplies to overseas Dominions and Colonies. In almost all the Dominion countries the period since the war has witnessed a growing transition from agrarian to industrial activity, particularly in the local manufacture of cloth piece goods with attendant requirements of dyes, dyestuffs and alkalis, while at the same time increased attention, especially in India, is being directed to agricultural development consequent upon the using scientific fertilisers.

Distribution of British Chemical Products among Four Dominions

South Africa

Conditions in South Africa are characteristic of trade movements, since British chemicals during the past year have succeeded in maintaining their predominant position. The gradual industrialisation of this Dominion, the inevitable extension of mining activities, and the increasing needs of growing trade ensure a continuance in the future of favourable openings for chemicals. The present position is the more satisfactory to British manufacturers as German trade with South Africa may fairly be said to have reached its pre-war intensity and competition, except in one or two products, is hardly likely to become any keener. In dyes and dyestuffs, Germany is still some way from her pre-war average of trade, but has regained the chief supply of potash manures. Competition from U.S.A. is only serious in one or two lines. Quite the most startling item in the import statistics for last year is asbestos-cement, which came under the protective tariff of an anti-dumping duty, so that asbestos manufactures imported fell from £34,662 to £15,945. Moreover, extraordinary keen competition has made itself felt from Belgium. This was experienced first in 1922, when British imports were £9,319, as compared with £19,526 in the previous year, whilst Belgian asbestos products were valued at £17,505 and £8,517 respectively. In 1923 total imports decreased, but the proportions from each country remained about the same, the United Kingdom sending supplies to the value of £4,627, and Belgium of £7,302.

In the same year asbestos sheets from our rival amounted to £11,883, as against the figure of £2,105 from the United Kingdom. Despite the anti-dumping regulations, British cement manufacturers are making a good showing, and reflect increase in supplies to this market. During 1923 South Africa imported nearly 120,000,000 lb. of building cement, and over 270,000 lb. of roofing cement, of which items the British exports ranked at 50 per cent. of the former and 17 per cent. of the latter, valued in all at £61,088. This represents an increased supply of approximately 17 million lb. over the year 1922, and shows that practically all the expansion in this trade has gone to us.

As an importer of acids South Africa does not as yet occupy a position of world importance, since purchases of all classes of acid do not exceed £15,000 per annum, which includes, for example, roughly £1,000 worth of sulphuric acid. The feature of interest is the extent to which British chemicals hold a good share of the market. Boric acid is the largest import, and although imports fell last year by 7,000 lb. to 84,409 lb., British manufacturers maintained their virtual monopoly. With sulphuric acid, exporters experienced a slackening in the year 1922, but this has been more than regained during the past twelve months, when 27,607 lb., or more than 50 per cent. of requirements came from Great Britain. Last year there was also an important increase in alkalis, all of which came from the United Kingdom, the quantity having more than doubled, and showing a final value of £4,661. Most satisfactory headway is being made in connection with ammonium nitrate, of which this country now supplies 25 per cent. of requirements, whilst an almost unassailed position is held by us in respect of borax, soda ash, and caustic soda. In these lines trade has slackened of late, but this is, however, not assignable to entry on the part of competitors.

By far the most important item in our chemical trade with South Africa is cyanide of sodium, and for this product British supplies show both absolute and relative expansion. During last year, imports from the United Kingdom rose to nearly 6,000,000 lb. with a value of £244,376, and this was more than 100 per cent. greater than the purchases from us during the previous year—a satisfactory movement reflecting success in competition by British manufacturers.

In connection with price movements, recent reports from South Africa state that among industrial raw materials, soda ash, caustic soda and potash show considerably increased importation at lower price levels, but that, on the other hand, nitrates, glycerin, and sulphur have not responded to price reductions. There has, of course, been dislocation in gold mining and cessation of diamond mining, and to these causes may be attributed responsibility in slackening demand for explosive material.

The advance of Belgium in connection with asbestos is also accompanied by supplies of superphosphate and basic slag from this source, which has acquired the premier position, previously held by Holland in this respect. British cement manufacturers have been, however, successful in adjusting their prices to keep a satisfactory share of business.

Other products, for which demand is improving, include germicides such as arsenite of soda, the imports of which during 1923 from Great Britain reached £48,519, an advance of 85 per cent. on the figure for 1922. Magnesium sulphate requirements are developing, whilst litharge and silicate of soda are fairly steady. On the whole, the prospects of this market cannot be regarded as other than inspiring, and sound progress is being made.

Australian Imports

The Australian area occupies a good position in the chemical export trade by reason of its demand for such commodities as tartaric acid and tartrates. Australia is the second best market for British manufactures, and is quite likely to become one of the best in the near future. The total trade in drugs, chemicals and fertilisers during 1922 was £3,553,377, but expanded during 1923 to £3,894,435, whilst for the nine months ending March 31 last nearly £3,000,000 worth of chemical imports are recorded. Amongst the acids imported in any quantity may be considered boric, citric and tartaric. We supply practically all the requirements for the latter, which amount annually to 437 tons, and are worth at present £33,414. In citric acid, for which we have also a monopoly, imports from the United Kingdom have fallen from £33,925 to £12,813 during the last two years, whilst calcium chloride and cement have also experienced declines. Cream of tartar is quite one of the most important items in our trade with this Dominion, and it is satisfactory to note that in spite of a falling-off in the total quantity taken from all sources the British trade has increased. During the last recorded years absolute imports moved from £415,526 to £213,713; the French share fell from £217,339 and our own increased from £99,629 to £126,456. Cyanides of potassium and sodium also play a conspicuous rôle in our business with the Commonwealth, but in these commodities the position has become slightly less favourable through a drop in purchases from the United Kingdom amounting to 200,000 lb., so that present supplies are 1,369,933 lb.; nevertheless British manufacturers maintain a first-rate position and recovery is probable.

Dye imports, although an important item, reflect diminished demands, but British manufacturers have not suffered so seriously as competitors. Synthetic dyes of United Kingdom origin have fallen from £282,283 to £136,833, and total imports from all sources have moved downward to £162,498 from £412,841. Similar conditions are applicable to vegetable dyes, with total purchases from other countries declining from £89,333 to £47,527, although our share of the market has advanced from 57 per cent. to 75 per cent. In this connection it is well to note the development of local supplies, as instanced again with sheep-dip and insecticides generally, for which there used to be a fair trade, but which is now met by internal manufacture.

Various products in which we meet most of the market are only just recovering after a drop in trade. Imports of refined glycerin fell off in a startling manner, as did also the different sodium compounds. Soda ash decreased from over 29,000 tons to 13,047 tons, or from £248,043 to £119,477, which hit British exporters, since our monopoly in this line is almost complete. Water-glass displayed a somewhat similar position, but sodium sulphide maintains a steady demand. Caustic soda has shown improving conditions for British trade, despite a decline in imports from other countries, and it is to be hoped that the application of the Industries Preservation Act may not disturb this condition of affairs. Relaxation of keenness on the part of U.S.A. has somewhat minimised their competition. Values of imported caustic soda during 1921–22 were £83,278 from the United Kingdom and £56,409 from U.S.A., to be followed in the succeeding year by £9,395 from this country and £4,359 from our rival.

Undoubtedly the best markets for chemicals in Australia are located in New South Wales and Victoria. During the past three years the average proportion of the whole Australian imports taken by these States amounts to practically 75 per cent., with the proportion of New South Wales at 40 per cent. of the aggregate for the Commonwealth. The point to watch in connection with Australia is the impetus to local chemical manufacture, which is, however, proceeding slowly. We have obviously not lost ground to other suppliers, since total imports into Australia of recent years have declined in greater proportions than have imports of British chemicals alone. This results chiefly from the conditions forced upon the Dominions during the war, as a consequence of the removal of the previous German monopoly. The directions in which Australian industry is mainly active are the preparation of ammonium sulphate, cement, soap, soda crystals and sheep dip—the last-named being now almost entirely produced within Australia itself.

The Demand in India

Statistics of commerce in chemical commodities with British India during the latest available period covering the financial year of 1922–23 were not only satisfactory but also somewhat reassuring, after the temporary set-back experienced in the previous season. Demand for the chief products seems to have been up to the customary degree of intensity, and the total trade in chemicals, excluding manures, imported into India amounted to 20 million rupees as compared with 19 million rupees during the preceding twelve months. Imports from the United Kingdom rose from 13 million rupees to approximately 14 million, so that last year we enjoyed almost 70 per cent. of the trade.

The chief acids purchased by this market are carbolic, citric and tartaric, all of which showed some improvement upon the previous year. Imports of the first rose 60 per cent. to £4,100, of the second from £1,700 to £5,066, and of the third from £4,156 to £5,584. Being typical of the acids for which competitors have attempted to impair our position, sulphuric acid merits attention as worthy of consideration since British supplies have tended to decrease more rapidly than the movement of the total imports. The actual decrease in sulphuric acid from the United Kingdom is from £15,228 to £2,139, and the absolute decline in British acids from £38,224 to £23,926—the difference in trade having gone to Continental exporters. Ammonium products on the whole are doing well, with a rise in purchases from this country from 573,745 rupees to 725,621 rupees, and this is due chiefly to enhanced demand for ammonium chloride, which increased remarkably from 350,789 rupees to 605,636 rupees. On the other hand, imports of alum in which we have two-thirds of the total trade showed a slight decrease, whilst aluminium sulphates have dropped from 399,859 rupees to 285,151 rupees

In regard to bleaching materials the downward trend of the past few years continued, but the advance in Indian cotton manufactures manifested itself in steady demands for dyes and dyestuffs of British origin. Copper sulphate is now developing in satisfactory manner and has recovered most of the ground lost in this branch of the trade during 1922, the imports being now valued at over 160,000 rupees. Disinfectants show a similar position though the 1922

statistics were not proportionately quite so low, the imports during the past three years having been 816,700, 501,681, and 690,786 rupees respectively. With glycerin the movement was much the same, except that the increase of last year was more marked, and the market for this commodity now makes better showing than at any time since the boom.

In all these products the United Kingdom is the main supplier and has little competition to face. Some decrease in certain products is to be noted, due to slackening demand and competition, so that lead compounds have fallen during the last two years under review from 96,318 rupees to 86,675, and magnesium compounds (chiefly the chloride and sulphate) from 118,000 rupees to just 64,000 rupees, whilst zinc salts have decreased nearly 33 per cent., although the British supplies at 244,902 rupees are still quite good. The significant features of the Indian market are fortunately very favourable to United Kingdom exports, and in both potassium and sodium compounds expanding business is being effected. Potassium salts, including the bichromate, chlorate, cyanide, and nitrate, are now taken annually at over £30,000, whilst sodium products are valued at £837,000, and this latter represents an increase of £90,000 over the total taken during 1922. The main line of progress is in connection with caustic soda, which has had a 50 per cent. development within this period, and this seems to be a direction along which British chemicals might do better business. Another important sphere is that of chemical manures with which the agricultural section of the Government has been experimenting for many months, and is one in which British exports have little competition to consider.

Chemicals for New Zealand

An empire market in which manufacturers in the United Kingdom experience the greatest encouragement and the least possibility of external rivalry is to be found in New Zealand, where our trade is gradually moving upwards with the latest yearly figures indicating that British chemicals are imported to the extent of £568,366. This covers 52 per cent. of total requirements. A transit trade via Australia is effected, but this, in common with supplies from foreign sources, has tended to be reduced. U.S.A., for instance, as our chief competitor shows a decline from £243,369 to £230,895 throughout the past two annual returns. One of the products imported in largest quantities is common salt, and the value of the imports of this commodity have increased from £72,100 to £98,954. Dyes are another important item in the trade, and out of imports from all sources valued at £78,782 nearly £52,000 worth came from the United Kingdom, with the major portion of the remainder hailing from U.S.A. Germany at present sends but little, nevertheless serious competition may be anticipated since the embargo on German chemicals has now been lifted.

New Zealand is almost entirely engaged in pastoral pursuits and insecticides with washes are imported in great quantities. Last year's total requirements were valued at over £70,000, and of this "sheep dip" is the chief constituent with imports aggregating £64,129. Almost all of this came from Great Britain. Another import of major significance are the soda compounds now computed at £82,386, which reflects a doubling over the amount purchased during the previous twelve months, and tends to offset the accompanying decline in import of cyanides of potassium and sodium from £30,505 to £15,939. Competition is being faced from Dutch Borneo in regard to paraffin wax, but nevertheless headway has been made. Another product which promises progress is cream of tartar, the purchases of which from this country have risen from £857 per annum to £7,940 within recent years, although even large quantities are taken from France and U.S.A. Imports of asbestos might with advantage be considered, as last year's supply was down to £11,698 after reaching £20,442 during the preceding year, whilst chemical manures, although improving with present United Kingdom supplies at least three times greater than hitherto, show that we still command only 9 per cent. of the market. Moreover, recent report indicates developing demands for disinfectants, although we now supply £23,684 worth during the year or £6,000 worth more than previously.

Some Conclusions

Empire trade in chemicals is far from being an illusory subject which constant reiteration has to keep alive in the mind. The facts of the present situation are that economic conditions in these countries are now well established along a steady path of progress and that dependence upon this country for chemicals in the future is a growing certainty. Closer study of their agricultural achievements and industrial aspirations will bring undoubted advantage to the British exporting chemist.

E. C. W.

Sir William Pope and the Daily Press

The Need for Team Work in Research

An article appeared in *The Times* on Monday calling attention to Sir William Pope's Trueman Wood lecture, which was delivered in May at the Royal Society of Arts. The points specially selected for comment were those dealing with scientific education and the need for team work in research. The present system of training in scientific schools and institutions leads students and workers to regard their particular subjects too much as separated in water-tight compartments. Chemists and physicists have in the past looked upon the material world with different eyes, but during the past 25 years it has become gradually more recognised that chemistry and physics are but two arbitrary divisions of the same subject. The general educational organisation remains unchanged, however, and the gaps between chemistry and physics and physiology tend to remain, although it is clear that it is just in these gaps that there lie at hand the most valuable openings for research. By organised team work it should be possible to investigate rapidly all the 10,000 possible organo-arsenic compounds, and so obtain the one which may be capable of existence, which would be immeasurably superior to all the others as a curative agent. Again, by collective effort new and valuable alloys could undoubtedly be discovered, with strength, lightness, lower cost and resistance to corrosion combined in one metal.. If industrialists, instead of being content with the few alloys known, were to initiate research of this kind the ideal metal would probably soon be found.

The "Yadil" Dispute.

Sir William Pope contributed a long article to the *Daily Mail* of Tuesday, which was given a prominent position, dealing with "Yadil," the recently introduced and much-advertised antiseptic, which is described as a preparation of essential oil of garlic, chemically known as "trimethenal allylic carbide." Sir William Pope points out that this name is meaningless in itself, and states that the substance consists of about 1 per cent. of formaldehyde, about 4 per cent. of glycerin, the remainder being water and a "smell." The smell, he says, can be imitated by adding about one part in four million of essential oil of garlic, and one part in two hundred thousand of essential oil of mustard to a mixture of the above composition. Formaldehyde, it is pointed out, is recognised as a poison and prohibited by public health authorities for addition to foodstuffs. The price of "Yadil" is £4 10s. a gallon, and Sir William Pope states that one of the leading firms of manufacturers of pharmaceutical products offered to supply a material of the composition indicated at a cost of 1s. 6d. per gallon, made up with distilled water. On Wednesday the proprietors of "Yadil" announced in their advertisements that they will publish in a few days a detailed reply to a recent criticism.

A Note on Chemists in Industry

By Norman Sheldon, A.R.C.S., A.I.C.

THE editorial note on this subject in THE CHEMICAL AGE of July 12 is of interest to all chemists and should interest all manufacturers. During the war the work of the chemist was advertised to a greater extent than ever before. The general public began to realise the immense value of the work done in the innumerable laboratories which were hidden in "basements" and "top floors" of our cities and in dark corners of works all over the country. One side of the work of the scientist was in the limelight; the public could not escape knowledge which was forced upon them. Unfortunately, it was chiefly the destructive work of science that was in the minds of our people. The true field of science lies in the building up of industry, and I have no hesitation in suggesting that there is not a single factory in the world which would not benefit by the inclusion of a man with scientific training on its staff.

When the war was over it appeared for a while that British manufacturers did at last realise that science paid a dividend. Many chemists were employed in works that previously possessed no laboratory. In 1920, when the "great slump" began, we saw once more that we were living in a "fool's paradise," for the technical staffs were among the first to suffer by dismissal or suspension. Research was immediately curtailed or abandoned, and only the minimum of routine testing was allowed.

The Chemist's Chief Work

How few manufacturers realise that the chemist's chief work should be to help him to produce a better article in a better way at a lower price, and by benefiting a greater number of people build up a bigger business. In time of trade slackness this work should be carried on with greater energy. Every manufacturer knows that if only he could sell his products at a certain price A, he could do ten times the business he is doing at the higher price B. The man of science can help him to produce and sell at a profit at price A.

The question of price is discussed by Sir Ernest Benn in his article. His remarks are extremely valuable, and if only manufacturers would study this side of their business more fully I feel sure we should soon be hearing very much less about bad trade.

The greatest example of the success of this policy is the Ford Motor Company. The Ford business has been built up on the principle that the public fix the price of the article, and the manufacturer must work down to that price by using scientific methods and not by taking advantage of sweated labour. Almost every works in the country will have occasional examples of this method, but very few attempt to carry on the whole of their business on these lines.

Professor Morgan has done well to plead for more extensive employment of scientific men on industrial problems, but it will be necessary for his individual effort to be followed up systematically by some body of chemists in a position to gain the public ear. The chemists of Glasgow have recently been doing very valuable work in this connection by writing articles for the press. The *Glasgow Herald* has been very willing to assist by publishing articles regularly, and chemists as a whole are indebted to them for what is probably the first serious attempt to educate the public with regard to the extent to which the application of scientific knowledge enters into the manufacture of almost everything they use.

Manufacturing is a phase of commercial activity that is entirely dependent for its existence on *selling*. It is far easier to make an article than it is to sell it, and yet we find so many works endeavour to run their sales on most unscientific lines. They probably spend a little on advertising, they have a few agents and possibly one or two travellers who are little better than order takers, but we find so frequently that there is no one on the sales' staff with a trained mind, and still less frequently do we find a mind trained in science. There is great scope for the chemist, the physicist and the engineer on the selling side of industry.

The salesman, whether on the road or at the works, is primarily the intermediary between the producer and the consumer. It is his business to understand what the consumer requires and to meet his needs, and he must be able to explain to the works exactly what they must produce in order to get the business. If prices are too high the salesman should play a very important part in reducing the price, for he alone fully understands where alterations can be made without interfering with the needs of the consumer. The idea that a salesman should be able to persuade a customer to buy just what the salesman has to offer and nothing else is an erroneous one, and can only meet with limited success. There is always the opening for someone to come along with an article that more nearly fills the consumers' needs, and then the newcomer gets the business.

Scientific Knowledge Combined with Originality

The manufacturer who can find out just what the consumer will buy before anything else, and who can supply the article at a price that the public can afford to pay, is bound to build up a big business. To do this is not the miracle that some of us suppose. If the works possess men with scientific knowledge combined with originality and initiative, and who are capable of working harmoniously right through the system from raw material to consumer, there is no reason why success should not be attained. It is only by adopting this method that we can hope to find work for all our people and to build up a big trade in the markets of the world.

The chemist can help at every stage. I do not say that every chemist can help at every stage. One reason why some manufacturers do not employ chemists on the commercial side of their staff is because they have the idea deeply engrained that a scientist is a fool at business. That is quite a wrong idea. If scientific men were given the opportunity of acquiring commercial knowledge early in their career I venture to suggest that they would compete very easily with the so-called business man.

Here is further scope for our able friend, Professor Morgan. I should like to hear that he is arranging for all his students to take a short course on commercial subjects before they leave the University, and to enable every student who is attracted by what he learns to go more deeply into these subjects with a view to taking appointments where combined scientific and commercial knowledge is of value. If a certain number of students were to take up these studies instead of doing so much pure research in their post-graduate courses they would find greater scope and more lucrative posts awaiting them on completion of their university career.

The Institution of Chemical Engineers

MR. C. J. T. MACKIE, assistant secretary of the Institution of Chemical Engineers, writes:—"In connection with your excellent account of the annual meeting of this Institution, published in your issue of July 19, I beg to draw your attention to two omissions from the result of the ballot for the election of honorary officers and council. There are two vice-presidents of the Institution, the name omitted from your report being that of Sir Frederic L. Nathan, K.B.E., while from the names of the members of council that of Mr. James MacGregor has been omitted."

Professor J. B. Cohen's Retirement

THE approaching retirement of Professor J. B. Cohen, F.R.S., from the chair of organic chemistry in the University of Leeds, mentioned in our issue last week, will be regretted in all chemical circles. Professor Cohen received his early education in chemistry at Owens College, Manchester, and after a period in the works of the Clayton Aniline Co. was appointed demonstrator in chemistry in Manchester in 1884. In 1890 he became lecturer in organic chemistry in the Yorkshire College, Leeds, and when the chair of organic chemistry was established in the University of Leeds in 1904 he became the first professor, a position which he has held ever since. His work on problems of the constitution of organic compounds, his valuable textbooks and his success as a teacher are well known. Professor Cohen, who is an original member of the Society of Chemical Industry, has served as a member of Commissions on smoke abatement and chemical warfare, and was a vice-president of the Chemical Society in 1920-21. He will probably continue his research work in one of the University laboratories.

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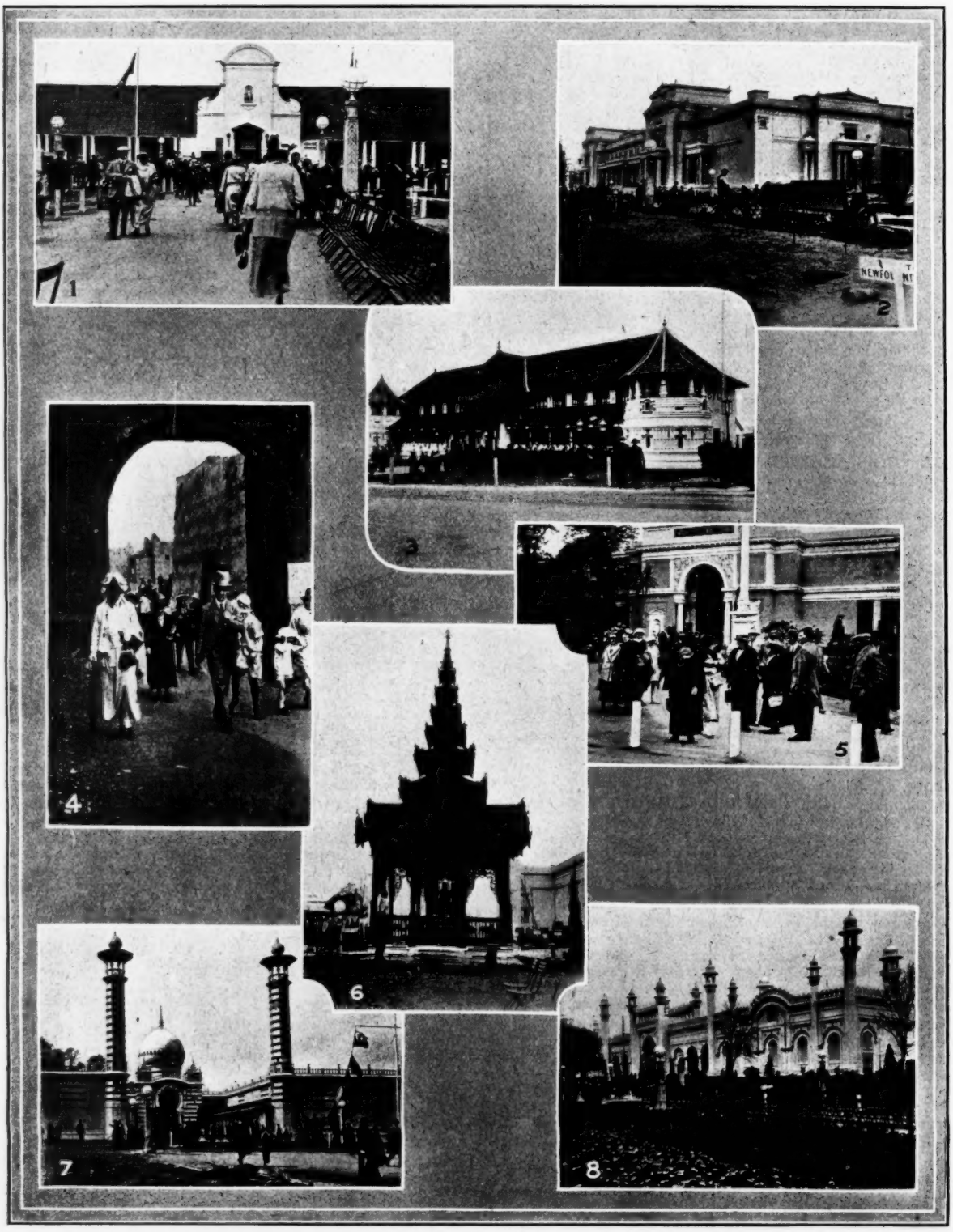
VIEWS OF SOME OF THE DOMINION BUILDINGS AT WEMBLEY



1. South Africa. 2. Canada. 3. Ceylon. 4. Nigeria.
5. New Zealand. 6. Burmese Shrine. 7. British Malaya. 8. India.

Dominion Chemical Products at Wembley

An Outline of the Empire Chemical Exhibits

The Canadian Building

THE Canadian building is one of the largest at Wembley, except the two great Palaces of Engineering and Industry, covering as it does 5¾ acres. A great deal of the space inside is devoted to panoramic model scenes showing the prairies, lakes, rivers, mountains, etc., and indicating thus the nature of the country and its products. Exhibits of chemical interest are mainly to be found in the south-east corner of the building. There is a combined exhibit of chemicals by the Canada Carbide Co., Ltd., of Montreal, and the Canadian Electro Products Co., Ltd., showing calcium carbide, acetic anhydride, acetaldehyde, carbon black, etc., and the uses of dyes in the colouring of silk, ebonite and other materials. The Dominion Tar and Chemical Co. illustrate the immense resources behind their wood and tar products by a model of a timber train passing through the forests. In other parts of the building will be found samples of a large variety of wood products, while there is a whole section devoted to the various types of coal and its products obtained from the Canadian coal fields which are described as the largest in the world, although hardly developed to any extent at present. One of the smaller but more striking of the scenic exhibits shows a nickel-smelting works in operation as it appears at dusk.

Australia and New Zealand

The Australian pavilion is actually the largest of the Dominion buildings in the Exhibition, covering nearly six acres. There is a splendid display of the products of the country in the pastoral, agricultural, dairying, mining and fishing industries. The mining exhibits contain much of interest to the chemist, for they show how iron and zinc ores in the Broken Hill district are won and worked. Particular interest attaches to the process flow-sheets for the production of electrolytic zinc. The displays of minerals by the Departments of Mines of the various states are collectively almost overwhelming, covering as they do rare minerals such as radium ore and gold nuggets down to a large variety of commoner types such as lead ore, barytes, oil shale, phosphate rock, limestone, pottery clay, mica, talc, magnesite and many others. There is a working gold-crushing battery included in the mineral exhibits. Another working exhibit shows the distillation of eucalyptus oil in progress, the product being bottled by bottling machines on the spot and sold to the public.

The New Zealand building, which is near by, is also very large and devoted mainly to very fine displays of fruit, chilled meat, butter, cheese, and so on. There is little of direct chemical interest, but it is satisfactory to notice that on the dairy exhibits a notice states that the New Zealand dairying industry is based and dependent on scientific chemistry. Milk products are illustrated by a display of casein, illustrating some of its uses in making lacquers, varnishes, ivory and ebony substitutes. The refrigeration plant of the ammonia compressor type necessary to keep the perishable exhibits in condition may be seen working under normal conditions.

British Malaya

The Malaya pavilion is one of the most striking and decorative externally in the whole Exhibition, and includes exhibits from Singapore, Malacca, Penang, Labuan, and the Cocos Islands, as well as the Federated and Unfederated Malay States. The section is a large one and the great proportion of it is devoted to displays in connection with the mining, rubber, and oil-seed crushing industries, so that it is particularly full of interest for the chemist. Tin and china clay are the principal minerals, various types of open alluvial tin mines and the methods of working them being well to the fore. A special feature is made of the uses of tin and its salts, the metal being mainly used in South Wales, which takes over 36,000 tons annually for making tinplate. The application of tin salts in the dyeing industry as mordants is shown by some fine examples of fabrics dyed with British alizarine dyes. Rare elements such as thorium, zirconium, cerium, didymium and molybdenum are also found in the Malay States, and there is an instructive exhibit of the minerals themselves, and their uses in the manufacture of incandescent gas mantles, electric light bulbs, scientific instruments, alloy steels, etc.

The cultivation of rubber, the diseases affecting the trees, rubber latex, and the various forms of partly cured rubber are justly given a large area, as befits the country producing two-thirds of the world's rubber supply. Another flourishing industry in the Malay States is the extraction of various vegetable oils, and the exhibits show how some of these are grown, while there are samples of the nuts and seeds from which the oils are extracted. Bottled specimens of these oils include chaulmoogra oil, cashew nut oil, castor oil, cotton seed oil and ground nut oil, while there are also to be seen the distilled essential oils of cloves, limes and patchouli.

South African Minerals and Chemicals

The South African building is a most effective one, carried out in the old Dutch colonist style, and the exhibits inside show the various agricultural and mineral products of the country, while scenic beauties, civic and educational exhibits, are not forgotten. Thus there is a model of the science building at Grahamstown University and photographs of the bio-chemical laboratory of the Veterinary Division of the Department of Agriculture at Ouderstepoort, Pretoria. Chemical products to be seen include gums, natural dye extracts, tanning extracts, essential oils of peppermint, apricot kernels, etc., sperm oil, seal oil, pea nut oil, palm nut oil, and many others, particular interest attaching to the hydrogenated " hardened " oils made in South Africa by Lever Brothers. There is a wide range of fertilisers on view including lime, phosphate rock and superphosphate, ammonium sulphate, guano, crayfish meal, and so on. The mineral exhibits are extensive, and in addition to gold, diamonds, etc., and a working diamond-making plant there is coal and its carbonisation products, iron ores of various types, corundum, asbestos, mica, manganese ores, talc, gypsum, vanadium ore, germanium ore, kieselguhr and many other valuable deposits.

Indian Chemical Products

The Indian building is one of the most beautiful in the Exhibition, both outside and in, and displays of native handiwork naturally occupy a great proportion of the space. Modern industries are not entirely neglected, however, and in the Bengal court a display of heavy chemicals and many drugs can be seen. The chemicals include red lead, alum, iron sulphate, soda, and sulphate of soda. Casein is also shown, while caffeine from Indian tea is prominent. Nearby there are various fixed and essential oils and the seeds from which they are produced, among which may be mentioned the soya bean. There is also an instructive exhibit showing the stages in the production of various grades of rosin and turpentine from resin. In the mineral section there may be found various iron ores, coal, mica, and Burmese oil shale and its products. In another corner of the building there are various forms of magnesite, while the various lacs, shellac, buttonlac, seedlac, etc., to be seen on various stands have considerable interest.

Other Exhibits of Chemical Interest

There are, of course, numerous other pavilions containing items of chemical interest, too numerous more than to mention. In the Nigerian Section there are many oils such as ground nut oil and palm oil, and also a complete working oil milling and extraction plant. In the beautiful Burma building there are various essential oils, while a new addition behind this building is an oil shale extracting and retorting plant which is now nearing completion. In Newfoundland fish oils and cod liver oil are naturally prominent, and there is in addition a small cod-liver oil extraction plant. Ceylon, the West Indies, and other buildings can all show some natural product which is worked up by chemical or similar processes and thereby rendered valuable in export markets. Recently two oil-well drilling plants have commenced demonstration operations in the grounds.

The Association of British Chemical Manufacturers

Report of the Annual General Meeting

THE Eighth Annual General Meeting of the Association was held at the Chemical Society's Rooms, Burlington House, Piccadilly, W.1, on Thursday, July 17, 1924. Sir Max Muspratt, Bart., occupied the chair. The Chairman, in moving the adoption of the annual report, said: The Association has gone through a most successful and important year. We have no changes in the *personnel* of the Council to record, but there are members of Council who have taken up work in other spheres where their co-operation is very valuable. Our General Manager, not being satisfied with the small scope which the Association affords him, has become the President of the Society of Chemical Industry. Much as the members of the Council felt that it was asking them a great deal to allow their General Manager to devote much of his time to the other important body, we felt that in the interests of co-operation between everyone concerned with chemical industry and chemical science, we ought to grant the permission, and I feel confident that all the members agree with that wise course. (Applause.) Undoubtedly in the past the Society of Chemical Industry and the Association of British Chemical Manufacturers, although their membership in many ways overlapped, were not working in the close co-operation that was best for the members of the two bodies, and I am extremely pleased to think that under the late President of the Society of Chemical Industry, Dr. Armstrong, and under the presidency of our General Manager, Mr. Woolcock, that co-operation and close working together is going to be enormously improved. I have just come from Liverpool, where the annual meeting of the Society of Chemical Industry was held last week, and I believe it was a most successful gathering. The thing I gathered from it was that the close co-operation between manufacturers and others associated with the chemical industry has made great strides in the recent past, and I venture to think, with satisfaction and advantage to both bodies it will continue to make even greater strides in the future.

The British Empire Exhibition

Another method of co-operation between those interested in chemistry has been afforded by the very prominent part that this Association has taken in the British Empire Exhibition. When other industries were standing back and could not make up their minds, the chemical industry did decide that they were going cordially to support the exhibition, and the result, I venture to think, is an exhibit second to none of any given in the world, showing the complete range from the simplest domestic chemical products, through the more refined products, right away up to the pure Scientific Section. It is a chemical education for all who go to the exhibition. Nothing of the kind has been tried before, and no great exhibition in the future, I venture to say, will be complete which does not carry on that idea. The exhibition is showing the position this country occupies in science and chemical industry, and a vast number of students from all parts of the country are flocking to that exhibition and spending much of their time in the Chemical Section. Those students will help to form an enlightened public opinion of the next generation, and it is most valuable that chemical industry should thus take its right position. But the response of the general public also has been enormous. Even on a day like Bank Holiday, when one would think that the "Fun Fair" would attract all those who were in the exhibition grounds, the numbers who visited the chemical portion were very large, and very many bought those sixpenny text-books which were sold in the Scientific Section, showing how seriously and earnestly the general public are now taking the chemical industry. It has been mooted in high quarters that it may be possible that the exhibition will be opened again next year and succeeding years. I, for one, cordially welcome the suggestion and I hope that the chemical industry will again, as it has done this year, support it. I am certain that direct and indirect advantages to the whole industry and the individuals composing it will accrue.

Chemical Films

There is a reference in the report to the films for chemical industry. These films are being shown in quite a number of cinematograph halls throughout the country and they help to concentrate interest in the chemical industry. Any firm who wishes to give a private exhibition for their working people or people who might be interested in their particular line of business can always obtain the free use of these films just for the cost of the carriage.

Dyestuffs

On the subject of dyestuffs so much has been said and thought that I do not propose to make any long statement. All I wish to point out is this, that the subject is extremely difficult, and within the Association the interests are very conflicting. The Council of the Association has tried to keep the balance between these various interests and to make representations in the right quarter, not with a view to what is good for this firm or that firm, or for any group of firms, but to what is best for the whole industry. If at times we have trodden upon the corns of specific interests, that is unavoidable if we are to do our duty by the whole of the members of the Association.

Safeguarding Act

There is just a reference in the report to the Safeguarding of Industries Act. Unfortunately that has come into a sphere where political ideas play a larger part than industry; but Part I. is still to continue in operation for some little time to come, and I hope that as far as possible the subject will be kept away from political principle or prejudice—words, I am afraid, at times synonymous.

Consolidated Factories Bill

A question that is coming forward in the near future is the Consolidated Factories Bill. This deserves serious consideration. The Association has not taken a narrow-minded view with regard to such legislation; it has always tried to see the principles which the Board of Trade or the Home Office wished to have enforced in industry. At the same time it has taken the necessary steps to watch the matter, not with a view to blocking the progress of the principle, but to see that something workable comes out as a result of the discussions which have taken place. We are taking the same course of action in this field as we have taken in others—that is to say, we are approaching the matter with a sympathetic mind, with a desire to live in the present day, not looking upon the practice of the past as anything sacred which must not be touched. We do want to have good conditions for our workpeople.

In the question of Patent Law, chemical industry is largely interested, and seeing that a Trade Marks, Patents and Designs Federation has been formed, the Council has appointed a very excellent representative in the person of Dr. Rée. Next comes the question of assessment for rating.

Rating Problems

The Rating Laws of this country are an absolute quagmire. The thing has grown up with no definite principle as to how rates should be levied, and in this attempt under the Rating of Machinery Bill to deal with one section of the problem almost every other section has been involved, and every kind of principle (or want of principle) in connection with rating has had to be considered and if possible consulted. Personally, I am not very hopeful that very much is coming out of this Rating of Machinery Bill, and we can only hope that the inquiries that are going forward with regard to the whole principle of rating will, in the course of two or three years, cause something to emerge that will put upon chemical industry—the members of which, let it be remembered, are citizens—a fair incidence and not an unfair incidence. We do not want to push our burdens upon other people, but, on the other hand, we do not want to carry unfair burdens, and I hope that every member who can suggest how such consolidation can be obtained will give us the benefit of his experience.

A Census of Production

The census of production is shortly to be renewed. I welcome that decision very much indeed. The difficulties in quite a number of chemical industrial problems are due to the fact that nobody knows the conditions in which industry stands in this country, and one has to accept any statements

that suit the particular point of view that a speaker is elaborating. A census of production, properly carried out, in the course of a decade at the outside, will give a mass of definite information which will enormously aid us in all these problems of unemployment, of health, of taxation and of rating, and I am delighted to think that upon the committee which is to decide the form that this census is to take Mr. Perry has been nominated. It is a great responsibility, but we could not have it in more efficient hands.

Referring to the fact that he was addressing them for the last time as chairman of council, Sir Max Muspratt thanked the members of the council and the staff for the loyalty, the hard work, the initiative and the commonsense which they had shown, and which had made it a very easy and delightful duty to be chairman.

The Treasurer (Mr. C. A. Hill) seconded the report and dealt more particularly with the balance sheet of the Association.

General Discussion

In the course of the general discussion Dr. E. F. Armstrong referred to the question of transport. There were, he said, a very large number of bodies interested in the question of transport charges. All present, both in their capacities as industrialists and as private individuals, knew that the amalgamation of the railways had so far been of doubtful benefit to the public, and he felt that it was most important that an Association like their own should be very watchful of their interests on this point. If the railways took them in detail they were lost, but they might achieve something by standing together. He thought they could not congratulate themselves too much on their success at Wembley. The idea of having an exhibit at Wembley was undoubtedly their own, and although perhaps the idea of the Scientific Section did not originate in their council, he asserted that nobody else would have carried it out in the way it has been carried out except the Association.

Dr. Levinstein said he would like to emphasise the great value of the co-operation with the scientific societies to which reference had been made. The success of the scientific exhibit was very largely due to the assistance given by the Royal Society. They had found a most willing and friendly spirit and were able to mark out a sphere of influence for the Association. As one who knew a great deal about the subject of dyestuffs he was naturally precluded from making any useful remarks. (Laughter.) He contented himself with endorsing the very diplomatic language of the report. He thought the Association was going on from strength to strength, and that the report spoke very favourably for the position of the chemical industry in this country.

Sir John Brunner referred to the Chemical Engineering Department of University College, London. The Association knew that an experiment was being tried in education—namely, to form what was very sorely needed in chemical work, a means of study for the chemical engineer. It had been a great point of controversy among those who managed chemical works whether it was possible, in the time which is allotted to a student, to make a chemical engineer. Many people thought that if you were to try to perform any such task you would turn out a half-baked engineer and a half-baked chemist, and that it would be very much better to divide your own staff into two, to have a thoroughly well-trained chemist and a thoroughly well-trained engineer. But there were very many places in our far-flung Empire where one could not afford to have a large staff, and it seemed to him that there would be great openings for the men trained in this Chemical Engineering Department. Every man so trained would be able to go abroad and take jobs single-handed as managers of, not exactly chemical works, but works where chemistry was a very essential part in the running of the works—such as a sugar factory.

The Rt. Hon. J. W. Wilson said he believed that the Council in the past year had always endeavoured to work for the general welfare of the chemical industry, and he thought that on the whole the results had been satisfactory and the Association had amply justified itself, even apart from Wembley.

Mr. Sadler suggested that the Association should pay its way and that they should call up the full 100 per cent. for this next year.

Dr. Rée (Chairman of the Manchester Chamber of Commerce) said that the Association had fulfilled to a great extent the ideals with which it started. In the old days there was a good deal more friendliness between the British and German manufacturers than between the British manufacturers themselves. That condition of things was now completely altered and very much to the advantage of the industry.

The motion to adopt the report was then carried unanimously.

The auditors, Messrs. Feasey and Company, were re-elected.

Mr. Parnaby (Chairman of the Committee of Scrutineers) read the results of their scrutiny, and the chairman declared the elections duly carried out.

Dr. F. E. Armstrong proposed a very hearty vote of thanks to the chairman, Sir Max Muspratt, which was seconded by Sir John Brunner, and carried with acclamation.

Annual Dinner

In the evening the annual dinner of the Association was held at the Lucullus Restaurant, British Empire Exhibition, Wembley, and was presided over by Mr. D. Milne Watson, D.L., M.A., LL.B., the newly elected chairman of the Association. The guests, among whom were a number of representatives of the most important chemical organisations abroad, included the following :—

Mr. Percy Ashley, Assistant Secretary of the Board of Trade ; Professor H. E. Armstrong, Professor Wilder Bancroft of America, Vice-President of International Union of Pure and Applied Chemistry ; Mr. Percy Cazalet of the Chemical, Metallurgical and Mining Society of South Africa ; Prince Ginori Conti of Italy, President of the Federaziona della Associazioni Industriali Chimicke ; Mr. L. J. Hunt, Prime Warden of the Dyers' Company ; Professor Jedlicke, Chemical Society of Czecho-Slovakia ; Professor Naoto Kameyama, Society of Chemical Industry of Japan ; Professor Riko Majima, Chemical Society of Japan ; Mr. S. J. Pentecost, President of the Society of Dyers and Colourists ; Dr. Sieger of the Dutch Chemical Society ; Dr. Werner Stauffacher, of the Swiss Dyestuff Industry ; Mr. N. Garrod Thomas, Professor J. F. Thorpe of the Imperial College of Science ; Dr. Valeur of the Société Chimique ; and Professor A. von Weinberg, Vice-President of the German Chemical Society.

After the Company had drunk the toasts of His Majesty the King and of the Rulers of the countries represented by the guests, the chairman proposed the toast of the evening, "Our Guests," coupled with the names of Professor Wilder Bancroft of America, Prince Conti of Italy, Dr. Valeur of France, and Professor von Wienberg of Germany, to which the four gentlemen suitably responded.

The evening concluded by a visit of the members and their guests to the Chemical Section of the Palace of Industry. The guests were conducted round the exhibits by Mr. Woolcock and other members of the Association, particular attention being paid to the exhibits in the Scientific Section, which received most favourable comment.

The Faraday Society

At the annual general meeting held on July 7, Professor F. G. Donnan, C.B.E., F.R.S., was elected to succeed Sir Robert Robertson as president. The annual report records considerable activity during the past year, the result of which is reflected in the accounts, which show a deficit of £109 11s. 5d. on the year. Eleven meetings were held during the year, and of these four were general discussions, which have become so striking a feature of the work of the Society. The subjects of these were as follows :—(i) Alloys Resistant to Corrosion ; (ii) The Physical Chemistry of the Photographic Process ; (iii) The Electronic Theory of Valency ; (iv) Electrode Reactions and Equilibria. The widespread appreciation in which the publications of the Society are held is indicated in the fact that the sales of transactions and reprints amounted to nearly £900, a figure in excess of the amount received for subscriptions. It is surprising to note that the membership of this very active Society is only 432, and that consequently an appeal for a larger membership is made in the annual report. Particulars relating to the Society may be obtained from the secretary and editor, Mr. F. S. Spiers, 90, Great Russell Street, London, W.C.1.

The Colour Users' Association Annual Meeting

The Effect of Reparation Dyes on Prices

THE fifth Annual General Meeting of the Colour Users' Association was held at the Milton Hall, Manchester, on Tuesday, July 22, Mr. H. Sutcliffe Smith presiding.

The Chairman, in moving the adoption of the Report of the Council, made special reference to the Technical Advisory Committee, which had been under the skilful guidance of Mr. Rawson, and to Mr. Holden, the Hon. Technical Adviser to the Association. They were also greatly indebted to Mr. C. M. Whittaker, who had ably collaborated with Mr. Holden on the Pricing Committee. He also thanked the members of the other standing committees, namely, the Publicity, Vigilance, Finance, Joint Technical and Pricing Committees, for their assistance during the past year, and expressed to Mr. Green and his assistants their thanks for their able and enthusiastic services. The help of the Board of Trade had been invaluable, and he specially mentioned their great indebtedness to Mr. Percy Ashley, C.B., who had at all times been willing to place his services at their disposal.

Three years ago, when he was called to act as their chairman, Mr. Sutcliffe Smith said he did so with one main object in view, namely, to deal with the serious situation resulting from the visit of the Buying Commission which went to Germany in 1920, and he was happy to say that that object had now been satisfactorily accomplished, as the final certificate has been received from the auditors, certifying that the commitment was now liquidated.

Safeguarding of Industries Act

Reviewing the work of the Association during the past year, the Chairman said: The Vigilance Committee on the Safeguarding of Industries Act, under the chairmanship of Mr. Charles Roberts, has done particularly good work of considerable material gain to practically every member of the Association. The cost to the Association has been negligible in comparison with the economies effected in obtaining a revision of the original list issued by the Board of Trade when the Act came into force. In the formaldehyde case alone the gain in the remission of the duty aggregates no less a sum than £3,700 per annum, and it has been estimated that in the articles now excluded from the list the gain to one section of the members alone in remission of duty amounts to approximately £20,000 per annum. The committee is still in being and will continue to watch your interests carefully.

Technical Advisory Committee

I have already made reference to this committee, whose principal function has been to deal with matters arising out of applications for licences, compilation of requisitions for Reparation dyewares and users' problems arising therefrom. Its useful work more than justifies the existence of the Association, if any justification were required.

Dyestuffs Advisory Licensing Committee

Thanks to the assistance of our Hon. Technical Adviser, Mr. Holden, the duties of your four representatives on this committee are very much lightened. The routine work of the committee is gone through very efficiently, and I am pleased to have this opportunity of expressing our appreciation of the fairness and broadmindness of the chairman, Sir Thomas Robinson. With the conflicting interests at stake it is amazing that the committee is able to cope with the volume of applications so regularly and efficiently at the fortnightly meetings.

A study of the licences granted during the past three years is instructive, and the deduction therefrom, I suggest, should be a matter of concern to the British makers. I am indebted to the Board of Trade for the following summary :—

Licences Granted.

	To be imported from Germany.		To be imported from Switzerland.	
	Lbs.	Value. £	Lbs.	Value. £
1921 ..	671,032	197,466	1,796,754	763,299
1922 ..	1,325,671	375,675	1,638,235	694,740
1923 ..	1,817,571	493,499	1,412,616	459,861

	To be imported from other sources.		Total.	
	Lbs.	Value. £	Lbs.	Value. £
1921 ..	209,719	82,056	2,677,505	1,042,821
1922 ..	270,987	33,404	3,234,893	1,103,819
1923 ..	461,253	36,177	3,691,440	989,537

These figures are exclusive of colour imported as Reparation from Germany, the sales of which during 1923 were no less than 1,049 tons. Whilst this table does not show the actual imports against the licences granted, it may be assumed that the figures approximate largely to the tonnages actually received. It is a disturbing feature that, despite the protection of the Dyestuffs (Import Regulation) Act afforded to the British makers during these three years, the quantities actually licensed for importation from abroad are on the increase, and I recommend the serious study of these figures to the British makers.

Dyestuffs Imported from Germany as Reparation

Mr. Sutcliffe Smith pointed out that no changes have been made during the year in the administration of requisitioning and distributing Reparation dyestuffs obtained from Germany, but owing to various imperfections in the present method of distribution a sub-committee appointed by the Council had considered the matter, and in summing up he made the following suggestions :—

1. That if an extension of the period of Reparation is definitely agreed upon by the other Allies it is desirable that Great Britain should participate.

2. That the present method of utilising the German monthly production list should be discontinued, and that in its place Great Britain should prepare a complete schedule of its requirements, both types and quantities, and that these quantities should be claimed so far as available under the option of H.M. Government. The estimated quantities required by Great Britain should be budgeted broadly on past experience by a close survey of the sale of Reparation colour and importations under licence during a stated period. In anticipation of this a complete analysis has been obtained from the Board of Trade, both as regards quantities and types, of the sale of Reparation colours during 1923, and of the licences granted during the same period. Based upon these two schedules a fairly accurate estimate can be prepared of Great Britain's anticipated requirements. The resultant schedule would take the place of the standard list of colours now in the hands of the British Representative in Paris, and it would cut out the necessity of reviewing the monthly record supplied to the Reparation Committee.

3. That the arrangements for obtaining and distributing Reparation colour should be carried out with the advice of a joint committee consisting of representatives of the Board of Trade, the Association of British Chemical Manufacturers and the Colour Users' Association. By reviewing the conditions of trade and the requirements of the country both from the makers' and the consumers' point of view, this committee would be in a position to advise the Board of Trade with regard to any questions of policy that may affect the interests of the various industries concerned. Representatives of this committee should also have the opportunity of assisting the representative of the Board of Trade at conferences in Paris where Reparation dyestuffs questions are being considered, particularly on any matters affecting general principles.

The distribution of Reparation dyestuffs during 1923 was as follows :—

	Kilograms.	Tons.	Per cent.
British Empire ..	7,664,993	7·543·93	29·96
Italy	6,274,601	6,175·50	24·52
France	4,276,533	4,208·99	16·72
Belgium	4,219,214	4,152·58	16·49
United States ..	2,391,589	2,353·82	9·35
Japan	679,313	668·58	2·66
Greece	67,006	65·95	·26
Serbia	10,140	9·97	·04
	25,583,389	25,179·32	100·00

According to the figures furnished, the British Empire was entitled to approximately 40 per cent. of the quantities received, so that it would appear from the foregoing that the other Allies were requisitioning and receiving considerably in excess of their proportion, or that we were not requisitioning anything like our full quota.

The Price of Dyestuffs

Dealing with the prices of imported dyes and dyestuffs, the Chairman quoted the following figures taken from the Board of Trade Returns, showing the average price per lb. of the main group of colours.

Average price per lb. of Finished Coal Tar Dyestuffs (exclusive of Alizarine and Synthetic Indigo).

Year.	Pence per lb.	Per cent. Increase over 1913.
1913 ..	11·7 ..	—
1920 ..	79·2 ..	577
1921 ..	66·7 ..	470
1922 ..	65·8 ..	462
1923 ..	49·8 ..	326

Although there was a marked drop in the cost for 1923 as compared with 1922, it would be seen that prices were yet 4¼ times higher than in 1913. He pointed out, however, that the average prices were not strictly comparable, because (1) the imports in 1923 consisted of a larger proportion of better types of colours now that a larger range was made in this country, and (2) the figures included Reparation imports which were recorded in the Customs returns at very low prices. As the figures were not available he was unable to give the average price per lb. of British colours ruling in 1923 in comparison with 1913, but from information furnished from representative users, he could state that the increased percentage in the aggregate was very similar to that ruling for foreign colours.

Mr. Sutcliffe Smith added that the wholesale prices index figure of the Board of Trade showed that the average wholesale commodity prices ruling in this country were only 64 per cent. above pre-war. There was no doubt that the three times factor principle agreed to by the Association and applied by the Licensing Committee in considering applications for licences also had its effect in establishing the general level of prices. If the factor were lowered it would immediately have the effect of causing foreign makers to reduce their prices. Users were, however, quite prepared to pay for dyewares a considerable increase on general commodity prices as their quota towards the establishment and maintenance of a British dyemaking industry. He thought users were agreed that 200 per cent. increase was too high under to-day's conditions, and that a basis of 150 per cent. increase should now be adopted. There was every justification for a further reduction in prices, not only on account of reduced cost of production, but also because of the fact that the prices ruling in other countries are considerably less than 200 per cent. increase over pre-war. The prices of some of the important chemical products used in the manufacture of synthetic colours showed a substantial drop. The figures were :—

	Pre-war Price.	Price at March, 1922.	Price at July, 1924.
Benzol	100	280	225
Toluol	100	360	210
Sulphuric acid D.O.V. .	100	222	161
Nitric acid 80° Tw. ..	100	200	134
Sulphur	100	223	123
Hydrochloric acid 32 ..	100	273	205
Aniline oil	100	240	155
Sodium nitrite	100	145	127

Users had urged that if the British makers would adopt the bold policy of reducing their prices, whilst at the same time speeding up their efficiency, they would obtain a considerable portion of the home trade which is now going to foreign makers and increase their export trade, and would automatically assist the users by creating a lower price level all round.

Progress in the Dyemaking Industry

It would be helpful if authoritative figures were published periodically, showing the actual production, under the various groups, of dyes and coal tar products. The Board of Trade regularly furnished statistics of the imports and exports under the different groups, and the publication of similar detailed figures to those issued by the Government of the United States of America might be considered. It would undoubtedly be helpful to users if there were published quarterly a complete statement of the dyestuffs in full detail as to types directly imported from various countries, and imported as Reparation, each group being shown separately. In addition it would be of considerable assistance if there could also be regularly furnished a census of the dye production of this country, on similar lines to that furnished in the excellent book which was published annually by the United States Tariff Commission.

B.D.C. and I.G.

At the two previous annual meetings at which he had presided, Mr. Sutcliffe Smith had made three suggestions with reference to this Corporation, namely :—(1) That the Government should cancel their loan ; (2) that the company should be re-constructed ; and (3) that the directors should see their way to have the Corporation managed by men who had been brought up in the industry, on the lines of the big textile associations.

He still considered that the Corporation would never attain to the position it should do unless these suggestions were adopted. He would go further, for he considered that not only should the Government cancel their loan, but that some means should be found to eliminate Government control entirely. (Hear hear). To-day he could not get away from the fact that there was a lack of confidence in the company and a vague feeling of uneasiness amongst users that the Corporation was losing ground as compared with its home competitors. It was only fair to state that the quality of its products had greatly improved and that it had extended its range considerably, but its progress was not commensurate with the advantages of the protection of the Dyestuffs Act and the support of the users in paying uneconomic prices, and he was afraid that too much nursing and sheltering under the Prohibition Act had not, in this particular case, been conducive to the greatest efficiency. It was with this feeling of uneasiness as to the present position and prosperity of the Corporation that the users had viewed the much-discussed suggested arrangement with the I.G., and in April a deputation from the Association put their views on the subject before the President of the Board of Trade, who kindly promised that he would have a further consultation with the Association before any agreement was ratified.

The main reasons which led them to object to the proposed agreement were that in their opinion colour users' interests were not sufficiently safeguarded. They had always affirmed two main principles, namely :—(1) That colour users must be assured of free access to the best quality and range of dyestuffs produced anywhere ; and (2) that they must be on as favourable a basis as regards prices as any of their world competitors, and that these prices should not be on such a basis as to retard the sale of their productions to the impoverished nations of the world.

Despite the difficulties with which they were faced, he was still definitely of the opinion that the dyemaking industry must be firmly established and developed in this country for national security, to ensure regular supplies of dyestuffs, vital for the colour using industries in the event of any European disturbance or war, and as a training ground for highly skilled chemists, so necessary for our future prosperity both in peace and war, but it was not unreasonable to ask that this should be brought about on an economic and not an artificial basis.

The report was carried unanimously. Mr. C. Rawson proposed, and Mr. W. W. L. Lishman seconded, a motion to confirm the co-option as members of the Council of Messrs. T. S. Cooper, A. Davidson and J. Ewing, in accordance with the rule requiring confirmation by General Meeting, which was carried.

No Award in Perchlorate Claim

No award was made by the Royal Commission on Awards to Inventors in the recent claim relating to an improvement in the process for the manufacture of ammonium perchlorate (see The Chemical Age, May 31, p. 573 and June 28, p. 682). The claimants were Messrs. C. W. Baily, H. S. Denny, A. J. Dunk, R. Young (Australia), A. Cresswick (Australia), and J. G. Williams (Australia). The case was heard *in camera* as the alleged inventions related to a secret process belonging to the Swedish firm of Carlson, now Stockholm's Fosfat Fabriks Aktiebolog, and operated in this country during the war at the Government factory at Langwith.

Institution of Chemical Engineers

Points from the First Annual Report

It is stated in the Report of the Council that at the first meeting of the Council in July, 1923, it was decided that the four following committees should be appointed :—(*a*) General Purposes and Finance ; (*b*) Education ; (*c*) Publication, and (*d*) Nomination. The work of the Education Committee was outlined at the meeting by Sir Frederic Nathan. The Publication Committee has arranged for the exchange of publications between the Institution and the American Institute of Chemical Engineers and copies of the Transactions for 1921-22 of the American Institute of Chemical Engineers have been sent to members.

Balance Sheet

In the Balance-sheet for the accountancy period—January 1 to December 31, 1923—the Revenue Account showed that the receipts from income amounted to £1,372 8s. 2d., whilst the expenditure has been £1,201 15s. 10d., leaving a sum of £170 12s. 4d. to carry forward to the year 1924. Whilst the expenditure shown comprises to a small extent items of a non-recurring character, in relation to purchases and printing necessary in the starting of the Institution, these are offset by the fact that the entrance fees on the income side of the account are, for the members already enrolled, a non-recurring item. Life membership composition fees, however, have been capitalised, and the amount now standing to the credit of that item has been invested in War stock.

Membership

The following were elected Honorary Members of the Institution during the past year :—M. Paul Kestner (France), Principe Gionori Conti (Italy), Dr. R. F. Ruttan (Canada), Professor W. K. Lewis (United States), and Professor F. G. Donnan, F.R.S.

On June 1, 1924, the membership of the Institution was as follows :—Honorary Members, 6 ; Members, 119 ; Associate Members, 76 ; Graduates, 17 ; Students, 3 ; total, 221.

The interest in the Institution, concludes the Report, continues to be maintained, and applications for membership have been received from all parts of the world.

China Clay as Sewage Filter

The properties of certain grades of china clay as a deodoriser are not so well known as they deserve to be, the cheaper grades of bleaching clays and mica china clays being most suitable for the purpose. Proof of this has been available at St. Austell, the centre of the china clay industry, for many years, for the sewage from Clayopolis enters the White river, flowing on to the sea, in a crude state, and through the filtering effect of the heavily charged mica clay water from the clay works, has resulted in producing no deleterious effects upon the public health. In fact, St. Austell has long since gained the reputation of being singularly free from infectious diseases.

With this practical demonstration of the filtration properties of china clay, more might be done in bringing it to the notice of manufacturers of sewage filters and purifiers used in the inland treatment of sewage on the septic tank system. It is many years ago since one of the biggest chemical works in Lancashire started producing a very effective purifier composed of a mixture of china clay, soot and sulphuric acid, the use of which is said to be so effective that after sewage has been subjected to its treatment over a certain area, the impurities are so completely eliminated and the resultant liquid so refined that it would have no harmful effects even if one were to drink it.

In a maritime county like Cornwall, where proximity to the sea renders the land treatment of sewage less necessary than in areas remote from the sea, the possibilities of the use of china clays as an important ingredient of filtering materials used in sewage work, and, for that matter, in filter beds for drinking water as well, have not been explored to the extent they might be. With the development of inland sanitation on the septic tank system, the more extended use of china clay in this direction should, if properly cultivated, open up additional markets for the cheaper and coarser grades.

Apprentices In Chemical Works

Discussion at the B.A.C.

An important discussion took place at the Sixty-second Council Meeting of the British Association of Chemists, held at Manchester on Saturday, July 19, concerning the employment of apprentices in chemical works.

It has consistently been the policy of the Association to discourage the training of chemists in any manner other than by means of a university course ; but it has been recognised, nevertheless, that training through apprenticeship may still be, in some districts, the only practical method. The Association, therefore, felt itself obliged to give the matter its careful consideration.

The evidence before the Council indicated that those who employed apprentices either showed a very real interest in their welfare or that they showed in it no interest at all, and there seemed to be very few cases standing between the two. Discussion revealed the fact that many firms required their apprentices to attend evening classes, and endeavoured themselves to instil theoretical and practical knowledge. Principals of the evening schools were asked to supply information periodically as to the apprentice's progress, and where promise was shown he was given every opportunity of increasing his knowledge. In one case, greatly to be commended, apprentices of promise were sent to the university at the expense of the firm who employed them. If all who could afford this would prosecute this admirable policy they would find themselves repaid a thousand-fold ; and the difficulty which the Association has to face in this connexion would be clean swept away.

Some Unfavourable Cases

On the other hand evidence was produced which showed that some who employed apprentices did so only with a view to obtaining cheap labour. The apprentice was required to do work of a menial kind ; no proper facilities for increasing his knowledge were allowed him ; and evening study, if not discouraged, was in some way insisted upon.

The Council was of opinion that no language was too strong to condemn this deplorable policy. It was unsatisfactory for the apprentice It was likely to produce friction among those whose work the apprentice was called upon to do, work that was their rightful heritage, and in no way proper to the apprentice. It was bad for the employer and bad for the industry he represented.

The Association proposes thoroughly to investigate this matter, since, in the circumstances, it is obvious that increased facilities for apprentices are, at least in some cases, necessary. Their interests ought, for the future, to be the concern of the scientific and general public.

Chemical Contract Case

On July 18 an appeal from the Sheriff Court at Glasgow by the pursuers in an action by Hollingshurst and Co. (Ltd.), chemical manufacturers, 112, Fenchurch Street, London, against Samuel Pitt and Co., chemical manufacturers, 95, Bath Street, Glasgow, came before the Court of Session. The pursuers claimed payment of £530 as loss sustained through the defenders' breach of contract. After certain negotiations carried out by correspondence the pursuers, on May 13, 1920, ordered by telegram 400 tons of basic slag, 20-22 per cent. phosphates, at 92s. 6d. f.o.b. Hull, and the defenders accepted the order also by telegram on the same day. The pursuers were signatories to a control agreement with the Ministry of Agriculture and were thereby enabled to export 10 per cent. of their production. The defenders and other manufacturers who had not signed the agreement were not permitted to export basic slag. The pursuers said that the defenders offered them 400 tons of basic slag which had been produced by a firm who were not signatories, and that the defenders thereby failed to deliver the goods for shipment in terms of the contract, as the defenders knew that the slag was required for export. The pursuers ultimately bought in against the defenders, and in this action claimed the difference in cost which they had had to pay compared with the contract price. As the result of arbitration proceedings the oversman found the defenders were in breach of their contract and were liable in damages and the costs of the arbitration. No power was given to the arbitration tribunal to assess damages.

The Society of Chemical Industry

To the Editor of THE CHEMICAL AGE.

SIR,—As one of the visitors who were privileged to see the Crosfield and United Alkali works last week, I was very much struck, not only by the general organisation, but by the attractive way in which British chemical products are now being prepared for the market. What we saw in the Erasmic building at Warrington—the beautifully fine quality of the products, the care and neatness with which they are packed, and the attractive and artistic designs—shows the immense advance which has been made on the marketing side of the industry. The samples we brought away of Erasmic products and of Greenbank Bath Crystals are reminders of the extent to which our wholesale manufacturers now prepare their products direct for retail sale, and of the great effect on an industry which the mere form in which products are prepared and packed for the retail markets may exercise. It used to be supposed that the Germans were supreme in the chemical quality of their products and in the attractive forms in which they were sold. But the purity and daintiness of the products we saw last week could not have been excelled by German or any other rivals, and we left with a renewed conviction that when British firms seriously set about a job none can do it better.—Yours, etc.

July 17. A MEMBER.

Brotherton and Co. *v.* Glasgow Corporation

LORD BLACKBURN, in the Court of Session, Edinburgh, has disposed of an action at the instance of Brotherton and Company, Limited, ammonia and tar distillers, City Chambers, Leeds, against the Corporation of Glasgow, regarding a contract between the parties and the price to be paid by the pursuers for tar and ammoniacal liquor supplied to them by the defenders under the contract. The contract was originally made in 1904 for five years, but was renewed from time to time. The third contract was for an indefinite period and terminated in July, 1920, when the defenders took over the chemical works at Provan gasworks. The dispute arose as to the construction of an article of the contract which dealt with the price to be paid by the pursuers to the defenders for the ammoniacal liquor supplied. When the case first came before Lord Blackburn, he repelled the whole of the pursuers' pleas in law and assoilzied the defenders in judgment delivered more than a year ago, holding that the construction put upon the article by the pursuers was erroneous. The pursuers reclaimed, and the First Division recalled Lord Blackburn's interlocutor and allowed parties a proof which has since been taken by him.

Lord Blackburn, in his judgment on the whole case, in reviewing the evidence, said he was satisfied that the proper construction had all along been placed by the arbiter upon the sliding scale, and under these circumstances he could only repeat his former interlocutor and assoilzie the defenders.

Fires in Dyestuffs Works

THE National Fire Protection Association has investigated the causes of 130 fires occurring in coal-tar dyestuffs and intermediates factories in America. Statistics show that a very high proportion of the fires were caused by due to special risks, and that both loss of life and damage to property was unusually high when compared with other manufacturing industries. The chemical processes were divided into four classes—sulphonation, chlorination, nitration, and reduction. Of the total of 134 fires, 66 were more or less directly connected with the above processes. Sulphonation generally involves the generation of heat, and six fires arising from this process were found—three in sulphonating benzol, one in aniline oil, and two in naphthalene and beta-naphthol in the manufacture of H-acid. Five fires arose in the chlorination process—one with benzol, one with toluol, two with aniline oil, and one with another substance. The nitration process was responsible for 17 fires. Reduction caused one explosion due to a too violent reaction between nitrotoluol in alcohol and zinc dust with caustic soda. Ten fires originated in driers, five occurring in steam-heated driers. The materials concerned were sulphanilic acid paste, alpha naphthalene, azo colours, alizarine brown, and sulphur colours. The drying and grinding of various colours was responsible for 31 fires, aniline and benzol ten each. Nitrobenzol caused nine, naphthalene eight, phenol and toluol six each, nitrotoluols and petroleum oils five each, naphthol four.

From this investigation it would appear that greatest danger arises from volatile liquids and solids of a flammable nature, as well as from flammable dusts.

British Pharmaceutical Conference

THE sixty-first British Pharmaceutical Conference, under the chairmanship of Mr. Edmund White, opened at Bath on July 22.

Mr. Rowsell, of Exeter, suggested two possible means of controlling the evils and abuses existing in the sale of patent medicines, either that the manufacturers must disclose the composition of the product on their label, or that there should be some machinery for controlling advertising. Neither course would be very acceptable to patent medicine manufacturers, but of the two evils they would probably prefer the former.

Mr. Sheppard (Exeter), urged that declaration of alcoholic content should be compulsory. The sale of pseudo-medical wines had, he declared, led to a great deal of secret drinking. Sir William Glyn Jones, secretary of the Pharmaceutical Society, said that many more or less patent drugs which ought to be on the poison schedule were sold, and he suggested that when a medicine contained a dangerous constituent its proportion should be shown on the label.

Effect of Zirconium on Hot-Rolling

IN a paper on the "Effect of Zirconium on the Hot-rolling Properties of High-sulphur Steels and Occurrence of Zirconium Sulphide," read before the American Iron and Steel Institute, Mr. Alexander L. Feild pointed out that zirconium eliminated red shortness when present in the finished steel in the proportion of 1·41 parts or more of zirconium to 1 part of sulphur; the ratio 1·41 corresponds to the formation of the normal zirconium sulphide, ZrS_2. Zirconium sulphide, like manganese sulphide, is plastic at rolling temperatures. Zirconium, unlike manganese, was not required in the finished steel in amount greater than that theoretically required for formation of zirconium sulphide, because of its powerful deoxidising action. In amount greater than that required to form the sulphide, zirconium confers on the sulphur content of the steel the property of insolubility in 1 : 1 hydrochloric acid, the percentage of sulphur thus rendered insoluble being proportional to the excess of zirconium in the ratio of 1 part of sulphur to 10 of zirconium.

The Future of Gretna

THE deputation of Scottish Labour members who recently visited Gretna has put forward several suggestions for the development of Gretna as a State property. These proposals include the immediate manufacture of alcohol ether and the retorting of unmarketable coals for oil, gas, and sulphate of ammonia. There are still four large plants with an ether production capacity of 200 tons a day, and one day's running would supply our peace demand for ether for a year. The plant could be converted for the production of alcohol ether, and an annual production of 50 million gallons is suggested, which the report says, would be of great importance for our power supplies. Another suggested use of Gretna is for treatment of coal containing fuel oil, which besides supplying oil would give useful by-products like sulphate of ammonia.

Gold from Mercury

A BERLIN professor, Adolf Miethe, and his assistant, Dr. Stammreich, are said to have discovered a method of disintegrating mercury and changing it into minute particles of gold. While investigating the chemical composition of the residue left after use in a mercury lamp Professor Miethe found that if a current of about 170 volts was passed through a lamp filled with mercury the metal underwent a change. If the current was maintained from 20 to 200 hours the mercury was found to contain gold. The metal that remained after the evaporation of mercury and after treatment with nitric acid consisted of fine kidney or grape shaped crusts of bright gold colour, which was proved by analysis to be pure gold.

Treatment of Effluent Gas Liquors

Experiments by Alkali Works Inspectors

THE Chief Inspector of Alkali Works in England and Wales (Mr. T. Lewis Bailey) deals in his report for 1923 at some length with the work of investigation which has been proceeding during the past two years with a view to finding an efficient and practicable method of treating the effluent from sulphate of ammonia and gas-liquor plants. The report states that this work has now taken on a somewhat different aspect. The original dephenolating towers, which were erected at the Hornsey Gas Works, continue to do good work, although it has not been possible, so far, to introduce there the use of fans as advocated in the 58th Annual Report, 1921. This method of effecting the passage of the fire-gases through the towers, instead of using a steam injector, will shortly be applied at another works. Calculation shows, however, that the heat brought in by the relatively dry fire-gases at, say, 350–400° C. is insufficient to maintain the temperature required for maximum efficiency, 85–90° C., in view of the large amount of heat leaving the tower in the exit gases; radiation and conduction losses, moreover, are necessarily high in a scrubber working at a temperature approaching that of boiling water. Additional heat is needed, and this will be supplied by waste steam admitted with the fire-gases.

Overcoming Difficulties

Difficulty has been experienced at one works owing to the unusual amount of free lime contained in the spent liquor from the ammonia still: there was rapid deposition of calcium carbonate on the scrubber packing, although this was an open type of packing frequently employed in chemical works. Passage of gases quickly became unduly obstructed. This difficulty has been successfully overcome by blowing the hot liquor with a certain amount of fire-gases at the point of entry to the settling pits. The precipitation of the excess lime here has the further advantage of promoting the coagulation and removal, in the settling pits, of something like 50 per cent. of the colouring matter due to higher tar acids, which would not be volatile in the towers. In laboratory experiments the addition of a small quantity of alumino-ferric solution to the hot liquor, after treatment with waste gases containing carbon dioxide, is found to promote clarification, and its use is now under investigation.

The spent liquor to be dealt with at Hornsey is a horizontal retort liquor, having an oxygen absorption figure of about 300 per 100,000. When we came to deal with spent liquors of vertical retort origin, however, very different conditions were found to exist; oxygen absorption figures were very much higher—usually 600 to 800 parts per 100,000. Moreover, the phenol, thiocyanate and thiosulphate content was much higher than in horizontal retort liquors generally. It was noticed, too, that the residue remaining in the distillation flask in the laboratory experiments remained very strongly coloured.

Phenols in Ammoniacal Liquors

In the case of horizontal retort liquors, it was found possible to calculate approximately the oxygen absorption figure from the composition of the liquor, but in the case of vertical retort liquors such calculation invariably gave considerably lower figures than were obtained by actual experiment. This suggested the presence, in the vertical liquors, of other oxidisable bodies, which did not volatilise on distillation, and the behaviour as regards colour with reagents (hydrogen peroxide, ferric chloride, sodium hydrate) pointed to the presence of higher phenoloid bodies, such as di-hydric and tri-hydric phenols. Confirmation of this view is forthcoming by the publication of the researches of G. S. Currey, of the Mortlake Gas Works, Sydney. Currey actually isolated catechol from the mixed phenols in the ammoniacal liquor, the presence of other polyhydric phenols being inferred.

Thus, in the case of vertical retort liquors, although good removal of mono-hydric phenols may have been effected in the dephenolating towers, there still remain ployhydric phenols, undesirable (*a*) by reason of their strong colouring properties, developed when the solution becomes faintly alkaline, as it does on mixing with a sufficient volume of hard water, and (*b*) by reason of their oxygen-absorbing property.

But, in addition, analyses of vertical retort effluents showed a high content of thiocyanate and thiosulphate, which further complicates the question of effluent treatment and disposal. The treatment of such liquors by dephenolation is manifestly insufficient, and, in the light of present knowledge, to follow this by complex biological treatment would appear to be of doubtful practicability, at any rate in the case of gas works, if only by reason of the ground space required.

Treatment on the Land

At the same time, it must not be forgotten that town sewage, mixed with ammonia plant effluent, can be quite well dealt with by treatment on the land, if the relative amount of such effluent is small and reasonably constant. There exist in the soil bacteria capable of decomposing phenol, ortho-, meta- and para-cresol, naphthalene, etc., sulphides, and thiosulphates. ("Micro-organisms of the Soil," by Sir John Russell and others, pp. 31, 37, 178.)

Recently Dr. Maclean Wilson and Mr. W. J. Read, of the West Riding of Yorkshire Rivers Board, have carried out an investigation on the treatment of these waste-liquors on a matured percolating filter. Their experiments indicate:—

(1) That a spent gas-liquor, diluted until the oxygen absorbed in 4 hours is 400 parts per 100,000, is amenable to biological treatment.

(2) That one filtration of this liquor at the rate of 15 gallons per cubic yard per day of 8 hours reduces the oxygen absorbed by 90–95 per cent., and removes 95 per cent. of the thiocyanate, yielding a highly nitrated effluent (at times containing as much as 10 parts of nitric nitrogen per 100,000).

(3) A further filtration of this effluent on a similar filter at the rate of 12 gallons per cubic yard per day of eight hours gives an effluent free from thiocyanate and absorbing less than two parts of dissolved oxygen per 100,000.

A considerable amount of laboratory work carried out in this direction during the past year is detailed in an appendix to the report.

Improving Gas Works Practice

In view of what has been said above regarding the difficulties attending biological treatment of highly polluted effluents of this class, attention was directed to a detailed study of the methods of condensation and storage of ammoniacal liquors prevailing in gas-works practice, with a view to ascertaining whether the methods usually employed are the best possible, or whether modifications are desirable, and at the same time practicable, which would have the effect of producing an ammoniacal liquor of considerably lower oxygen-absorbing property; in other words, whether it is possible by simple modifications to reduce the amount of thiocyanate, thiosulphate and polyhydric phenols in the ammoniacal liquor to be distilled, without at the same time depreciating the quality of the coal-gas or lessening the amount of ammonia recovered per ton of coal carbonised. The subject appears to be one that merits still further consideration by gas-works engineers and chemists.

Fractional separation of the bulk of the tar in the crude gas at the *hot* end of the system, if it is possible to effect this in the case of vertical retort systems where a dry gas main exists, also separation of tar and condensed liquor, as far as may be, throughout the plant should effect a notable reduction in the phenol and higher tar-acid content of the liquor. The experiments thus lead independently to the conclusions reached by Feld (*see* Lunge's "Coal Tar and Ammonia," 4th edition, Vol. II, p. 882). His procedure was directed to getting a better separation of tar and liquor, with the production of ammoniacal liquor richer in ammonia, but it should be equally effective in promoting the separation of an ammoniacal liquor less contaminated with higher tar acids.

The greater part of the thiocyanate and thiosulphate present in ammoniacal liquors is due to oxidation changes taking place when air is present (42nd Annual Report, 1905, p. 30). By minimising air leakage at the retorts and by the admission of air (in cases where such admission is favoured) at a point immediately before the purifiers the formation of thiocyanate and thiosulphate would be minimised, and in this connection cyanide recovery becomes a further point for consideration.

Picric Acid for Clearing Land

OVER 45,000 farmers in twenty-eight states have used picric acid to clear 250,000 acres of land, and to remove stumps from about 86,000 acres, according to the American Chemical Society. Nearly 8,000,000 pounds of this surplus war explosive have been applied to agriculture by the U.S. Bureau of Roads.

Increased Production of German Lignite

THE growing importance of brown coal or lignite in German economics was again emphasised at the recent meeting of the Mid-German Lignite Mining Institute, at Leipzig University.

The President, Dr. Piatscheck, said that under present conditions in Germany the utilisation of her enormous deposits of lignite to the best possible advantage was a vital national duty. Production in Mid-Germany had increased from 54,000,000 tons in 1914 to 95,000,000 tons in 1922. The introduction of the eight-hour day had seriously affected the industry, and it was only by working double shifts and using the most efficient methods that they were able to maintain output per man at 80 per cent. of the pre-war level. Working costs were also considerably higher owing to the increasing percentage of waste that had to be handled, the ratio of overburden to lignite gained having risen by 60 per cent. He added that the increase in thickness of this overburden by only one metre meant that the industry would have to deal with an additional 7,000,000 tons of waste per annum. It was therefore abundantly evident that the most economical methods of working should be adopted.

Another speaker, Dr. Jahnke, of Berlin, described the greatly increased use of lignite in electric power production. Ten years ago there were in Germany 1,600 municipal electric power stations. Of the total power developed 63 per cent. was from ordinary coal, 23 per cent. from lignite, 12 per cent. from water power, and 2 per cent. from oil. The use of high potential, *e.g.*, up to 100,000 volts, permitted the erection of much larger power stations in localities where fuel was most conveniently available. The first 100,000 volt electric plant running on lignite was erected in 1912 at the Lauchhammer Works in Gröba Riesa. This was quickly followed by the Rheinisch-Westfäl. Elekt.-Werke, which was practically the first to transmit long distance power (between Bonn and Cologne), using lignite as fuel. In Central Germany lignite is now chiefly used in the power stations of Saxony and Brandenburg, whilst water power is largely employed in South Germany. In 1920, of the total municipal electric power developed in Germany, 48 per cent. was derived from coal, 41 per cent. from lignite, 10 per cent. from water power, and 1 per cent. from oil.

At present large schemes of co-operation between the lignite interests of Central Germany and the water-power interests of the south and west are in contemplation. A giant power station, to be run on lignite, is now being erected by the Staatlich-Sächsischen Elekt.-Werke at the Hercules Mines in Hirschfeld. Other large stations, using lignite, have been built by the Elektro-Werke A.G. at Zschornewitz, at Trattendorf (near Spremberg), and at the Kraft-Werke Lauta, near the Erica Mine of the Ilse Bergbau A.G.

Valuable Products from City Rubbish

THE utilisation of city refuse has always an attraction because of its association with the idea of "wealth from waste." M. Bigot, in *Chimie et Industrie*, recently described the methods in use in Paris. After heating to dry it, the refuse is passed over a magnetic separator which removes ferruginous materials, and the remainder is then burnt. The clinker which results is used agglomerated with lime in the manufacture of brick. These bricks are used largely in the construction of buildings, particularly in the devastated regions. The furnaces used are of the blast furnace type, from the lower part of which the slag is drawn, pulverised, and mixed with lime.

M. Bigot has described an interesting furnace which gives other by-products. This furnace consists of a cylinder with a double jacket, the inner jacket being of reinforced cement and the outer jacket of a heat-insulating substance, such as asbestos. In the interior of this cylinder a metallic band revolves on which the rubbish is poured. The entire furnace is heated by the gas which circulates between the inner and the outer jackets at a temperature of 200°. The destruction of organic matter is nearly complete, and with the ashes obtained, which are not agglomerated like a slag, it is possible to make mixtures with lime and clay which burn at a temperature of 900°, giving siliceous bricks for buildings. These same cinders, heated with a variable quantity of silica, may give all the categories of glass, acid or basic, and make possible the manufacture of bottle glass, electric insulators, or slag cement.

Separating Oil from Water

THE Pirbright oil separator, a device introduced by the Pirbright Co., Ltd., Bond Court House, Walbrook, London, E.C.4, was recently demonstrated before a party of Press representatives at Messrs. Van den Bergh's Margarine Factory, at Fulham. Intended to be used for separating oil from water on board ship to avoid pollution of the sea, the plant has also several industrial possibilities, and at the works where the demonstration was given two have been installed to separate fats and oils from the waste waters in order to prevent pollution of the Thames.

The principle is very simple, the operation of separation occurring naturally under gravity in a large tank fitted with a few simple baffles, the oil rising gradually to the top. At the top of the tank is a cylindrical float-chamber, carrying a float which is buoyant in water but sinks in oil. When sufficient oil has accumulated in the float chamber the float sinks, automatically opening the discharge valve. If water enters the chamber the float rises and the oil discharge is cut off. Water is discharged at the bottom of the separating tank through a spring loaded valve. Although, of course, since separation is carried out under gravity the separator cannot deal with stable emulsified oils, its uses in treating "coarse" emulsions of oil and water or any other two non-miscible liquids should be very wide. There are openings for such an instrument in soap works, gas works, oil refineries, tar distillation plants, etc.; in fact, anywhere where it is desirable to remove or recover oil which finds its way into water.

Utilisation of Waste Sulphite Liquor

THE cellulose industry in Germany, writes Dr. Walter Roth in *Industrial and Engineering Chemistry*, has for some time been working on the problem of utilising its waste liquors, without reaching a successful solution. A brief review of these attempts was presented at the meeting of the Vereins der Zellstoff-und Papier-Chemiker und- Ingenieure, by Professor Carl G. Schwalbe, of the Forstakademie in Eberswalde. Even by the favourite process of alcohol recovery from the sulphite liquors, the greater part of the organic substance present is not utilised, as the fermentable sugars constitute only one-tenth of the organic matter of the liquor. Other processes, to use the organic matter as a tanning material, as a binding material, as an adhesive, have no special industrial importance, since the amounts consumed for purposes of that sort are very small. It has been further suggested that waste liquor might be evaporated to a thick syrup and burned as a liquid fuel under steam boilers. Moreover, Strehlenert has even obtained a solid fuel from the liquor, although this process has not been put into practice. Professor Schwalbe now obtains a complete separation of organic matter by heating the sulphite liquor with wood waste and magnesium chloride at 180° or decomposing the sulphite liquor with carbon, which is prepared by heating wood waste with potash liquor at 180°. Instead of carbon of this kind kieselguhr or certain lignites may be used. By the decomposition which takes place on heating, sulphurous acid, acetic acid, and methanol are separated. With carbon 60 per cent. organic matter is obtained, with a heating value of 6,000 to 7,000 calories.

Use of Sulphate of Ammonia

A NEW sixty-eight page booklet, which has just been issued by the British Sulphate of Ammonia Federation, contains a concise and informative resumé of the uses of sulphate of ammonia in agriculture in Europe and the tropics, by Mr. T. H. J. Carroll. The author deals briefly with the subject of plant life and its requirements, and in discussing the science of manuring emphasies the fundamental importance of supplying plants of all kinds with a sufficiency of nitrogen. Considerable space is given to a discussion of the advantages of the neutral quality sulphate and of its action in the soil. As evidence of the increasing popularity of this fertiliser among British agriculturists the author states that whereas its consumption for agricultural purposes in the British Isles was 40,000 tons in 1913-14, it had increased to 140,000 tons by 1922-23. The treatment of cereal and leguminous crops is dealt with in detail, while the cultivation and manuring of tropical and sub-tropical crops form the subject of a separate chapter.

French Chemical Industry Notes

FROM OUR PARIS CORRESPONDENT.

FURTHER improvements have recently been introduced by M. Georges Claude in his synthetic ammonia process with the object of using hydrogen from coke-oven gas. As in the course of the process the gas has to be compressed the opportunity has been taken to extract the benzol from it. In addition other valuable constituents have been separated by partial condensation, ethylene, for example, which may be used for the production of alcohol.

M. Claude is also experimenting on the utilisation of Alsatian potash in connection with synthetic ammonia. Sylvinite, which is a mixture of potassium and sodium chloride, is being investigated with a view to replacing the soda by ammonia and so obtaining a fertiliser containing both potash and nitrogen.

Synthetic Ammonia in Belgium

A corporation in which the French liquid air concerns are interested is constructing a liquid air and synthetic ammonia plant in Belgium at Ougrée-Marihaye. Hydrogen from coke-oven gas will be used and an output of 10 tons per day is expected. In Italy the Azogeno Co. is putting up a factory at Bussi with a capacity of 5 tons per day, and holds an exclusive licence for electrolytic hydrogen. A Spanish concern is contemplating an output of 15 tons per day from its synthetic ammonia plant.

French Synthetic Ammonia Production

The Ammonia Company constituted in 1923 with a view to utilising coke-oven gases for the production of synthetic ammonia by the Casale process is completing its installation, and its factories are expected to be in full swing early in 1925. This company has the exclusive licence of the process for France. It is one of the subsidiaries of the Compagnie de Produits Chimiques et Electro-metallurgiques Alais, Froges et Camargue, which in its recent annual report announced a 25 per cent. sales increase for the first five months of 1924 and a considerable development of its aluminium orders.

Copenhagen International Chemical Conference

Fifteen French delegates who took part in the Conference of the International Union of Pure and Applied Science (June 26-July 1) are urging their countrymen to seize the opportunity which they declare exists in Denmark for a more extensive commercial penetration. The question of the establishment of new rights for inventors and scientists was the object of a series of resolutions, calling on the various Governments to accord to the authors of scientific inventions and discoveries the right of profiting by every application of their work, and advocating the founding of international organisations for procuring the merited remuneration that a simple right of scientific property could not ensure. After a long debate on the question of atmospheric pollution, the Conference formally expressed the opinion that the acidity of fumes and gases (save anhydrous carbonic gas) discharged into the atmosphere from factories, should be expressed in equivalent grams measured at the point of emission on a cubic metre basis. It also put on record its view that the maximum acidity permissible in fumes, vapour or gases should be fixed in each country at 0·16 grams per cubic metre at 0° and under a pressure of 760 mm.

The next Conference takes place in June, 1925, at Bucharest.

Sulphuric Acid Manufacture

France has developed her manufacture of sulphuric acid to such a point as to be able now not only to satisfy completely all possible peace needs but to cope with any war demand which might suddenly arise. Before 1914 the yearly production totalled 1,160,000 tons—the German output at the same time being 1,650,000 tons. During the war important factories of the acid in the north, representing about a third of the national productive capacity, fell into the hands of the Germans, a fact which necessitated the creation of new sources of supply. As a result of the efforts made then and since, the French factories now existing are equipped to produce a yearly tonnage of 2,000,000 at 53° Baumé—the quantity requisite in war time. The ordinary annual requirements are about 1,500,000 tons. The hampering element of the industry is the necessity of importing the greater part of the pyrites, which are supplied by the Spanish province of Huelva. The pre-war pyrites imports attained 530,000 tons, the total consumption being 830,000. Though an important percentage of the Spanish reources are controlled by French companies, the inferiority of the exchange value of the franc in respect to the peseta renders the indispensable raw material very costly and maintains at a high level the price of sulphuric acid.

A Demand for State Support

The spokesmen of the French Chemical Industry continue to emphasise the necessity for State support to the strenuous developing efforts made since the war. The hope is expressed that the success that is being achieved in the domain of potash (391,000 tons of raw salts and 96,290 tons of pure potash during the first four months of the current year) will be followed up by the extension of the industries handling nitrogen dyestuffs and soda salts. With the Claude process, the Casale method and the Haber installation at Toulouse great achievements are foreseen in the nitrogen sphere. Since the armistice dyestuff production (the basis of so many other industries) has been pushed to a yearly level of 10,000 tons (from 7,056 in 1920) and imports reduced from nearly 6,000 to 1,371 tons. Though yet incomplete, this industry is rapidly becoming independent. The French, however, do not under-estimate the potentialities of German competition, and the greater proportion of the colour factories in Occupied Territory will shortly be under their control. France is still dependent on outside sources for supplies of sodium salts, but various projects are in view to remove this foreign domination, which include the establishment of a new works at Monguerre. Appeals are being made in Parliament to lay aside minor disputes and concentrate on the defence of French discoveries and interests.

Germany's Chemical Industry

THE Department of Overseas Trade presents an interesting review of the German chemical industry during June. The output of the Central German lignite mines suffered a decline as compared with May, but the lignite output in the Rhenish district in May, at 2,851,573 tons, showed an increase of 49·7 per cent. compared with May, 1923. In the potash industry inland sales were quite small, and foreign sales came up to expectations only in individual instances. Foreign prices are so low that costs of production are scarcely covered. The lack of capital and of sufficient credit has led to the closing down of various works, to the dropping of shifts and to the further curtailment of working hours. Up to the end of June about 12,000 workers were dismissed, and about 40 works closed down. Only a quarter of the potash works which were still in operation this time last year are now working. Negotiations are pending with American financiers in regard to the taking over of large quantities of potash and to the advancing of money on this purchase. The present prices, which are up to 40 per cent. below the pre-war level, are, however, to be further reduced in this connection. Such cheap prices can only be offered by the very best and most modern works.

Although the prices of all chemical raw materials were generally rather high, only moderate prices could be obtained for finished products, and workmen had, therefore, in some cases, to be dismissed.

Conditions in the dye industry became worse. The manufacture of intermediate products and dyestuffs declined and will be still further restricted. There was a serious falling off in inland sales of dyestuffs, but exports to China and Japan were, to a certain extent, satisfactory. Exports to British India were less satisfactory. The production of fertilisers again increased and reached the average level, and no difficulty was experienced in obtaining raw materials.

The position of the margarine industry is typical of the general outlook in regard to oils and fats; sales were again few, and the prices obtained were below cost. More small factories had to shut down, and the large concerns closed a considerable number of their subsidiary undertakings and are concentrating production in a few factories. The market possibilities for oils and fats have almost disappeared, indeed the export of oils and fats during June were insignificant. Foreign trade in oil cakes was, however, comparatively satisfactory, though prices were very weak. Here again works are closing down and staffs are being reduced on all sides.

"The Press and Industry"

Sir Ernest Benn and the International Advertising Convention

On Tuesday, July 15, Sir Ernest Benn, Bart., C.B.E., chairman of Benn Brothers, Ltd., delivered a paper on "The Press and Industry" before the International Advertising Convention in London.

Industry, he said, has in recent years become the plaything of politics. The slogan, "No politics in business," is now displaced by "There is no business for politics." Everybody is talking industry and business except the business men. The idea that business and politics are things apart is an attitude that is full of danger, not only for the business man but for the community. The Press, especially the trade and technical and industrial Press, must apply itself with all vigour to the new and urgent job of educating the community on business questions. If, for instance, the electors are to decide wages questions, surely the proper and necessary thing is that attention should be directed to a full understanding of the nature of wages. It is perfectly safe to say that the electors in this country would be quite happy to settle wages on the basis of the cost of living index figure. The business man who knows anything about economics knows that you might as well settle wages on the basis of the betting odds, or the birth rate, as on the basis of the cost of living. The two things have absolutely nothing whatever to do with one another. Wages come out of production and out of nothing else. The cost of living is a degrading measure by which to regulate them. The folly of the whole business is evident if one only remembers that a wage has to be paid before the article is sold, and that involves a lapse of time, that interval involves the payment of interest to somebody, and therefore the extra pound paid in wages adds something more than a pound to the cost of living. Thus every rise of wages without a corresponding improvement in production means a still wider gap between wages and the cost of living. The more, therefore, one applies this idiotic measure of the cost of living index, the greater becomes the disparity between the rate of wages and the cost of living. An index figure is neither a good reason for raising a wage nor for lowering it.

Again, take the question of profits. The general impression is that profits are a thing to be abolished, or, at all events, that they are made at somebody else's expense. In a matter like this the public mind is absolutely warped, and the business man, through the business Press, should try to get it straight. One cannot perhaps hope for very much help in the direction I indicate from the public Press, but the business Press is in a different category, and it must take a new line in this matter. We of the business Press must turn our attention to the principles of business itself. The world wants nothing more to-day than a course of instruction in sound economics. The business class must justify their profits, and this through the business Press. I am not asking for a great campaign, backed by self-interest. I place my cause on the far broader ground that without prosperous business the human race cannot survive. I claim that prosperous business and private enterprise are synonymous terms, and there is no hope of better conditions for any class without more information and sounder thinking on these questions. Herein lies the first duty of the Press towards industry and trade and the community as a whole.

The Mond Nickel Co., Ltd.

Sir Alfred Mond, presiding at the annual meeting of the Mond Nickel Co. in London on July 10, said that the credit balance for the year was £276,457, which showed a slight reduction as compared with the previous year. The decrease was due almost entirely to the low prices which had prevailed during the year for the company's main products—nickel and copper sulphate. He thought they could look with more confidence to the results of the next financial year. There was a gratifying increase of 47 per cent. over the previous year in the tonnage of nickel sold, and the demand showed a very steady increase. At the beginning of last year the company had definite commitments on its books to the extent of about 30 per cent. of their nickel annual production, whereas this year they started with orders in hand for about 70 per cent. of their production.

Chemical Matters in Parliament

Research Fellowships

Sir G. Butler (House of Commons, July 9) moved a new clause exempting from income-tax a studentship or fellowship granted by a trust to a person exclusively for the purpose of his pursuing research studies under the auspices of any university in Great Britain. He said the exemption claimed was purely for research work, and would affect only about 200 persons at one time. There were great difficulties in increasing the number of these scholarships, and the Government ought to do all it could to assist research.

Mr. Graham said that already a very large measure of exemption from income-tax was given in the direction which the hon. member had indicated. The logical position pointed to the limitation of the concession to its present extent. While they all sympathised with the objects of the clause, the remedy lay in larger grants to the universities.

Poison Gas Factory

Mr. Attlee (Under Secretary for War) (House of Commons, July 16) asked by Mr. Sexton whether a poison gas factory at Sutton, St. Helens, situated in a thickly populated district and closed down since the declaration of peace, was again showing signs of activity, said he was not aware of this. A wall to enclose War Department property was being built there and some experiments were being carried out, but these were less extensive than they were some time ago. The factory and its presence involved no more risk to the neighbourhood than would any other munition or chemical establishment.

Torpedo and Cordite Factories (Cost of Manufacture)

Mr. Hannon (House of Commons, July 16) asked the Parliamentary Secretary to the Admiralty whether it was proposed in future to publish the unit costs of manufacture at the Royal Naval Torpedo Factory and at the Royal Naval Cordite Factory.

Mr. Ammon said that in the public interest it was not proposed to publish the unit costs in future, but the information was available for the Public Accounts Committee if they desired it.

Lieut.-Commander Kenworthy asked whether the Government would extend this State manufacture of munitions so as to cut out altogether the private manufacturer?

Mr. Ammon said he would convey that suggestion.

Fertilisers and Feeding Stuffs

Mr. S. Robinson (House of Commons, July 17) asked the Minister of Agriculture whether he was aware that in a recent prosecution by the county council of Essex, under Section 6 (1) (*a*) of the Fertilisers and Feeding Stuffs Act, 1906, three witnesses stated on oath that they formed part of a deputation from the Retail Corn Dealers' Association which attended on the Ministry in 1921, and that on that occasion a definite understanding was come to with the Ministry that the provisions of the said section would not be enforced if there was a label in or on the bag containing the feeding stuff giving the required percentages of oil and albuminoids contained in the Acts, etc.; whether any such understanding as above mentioned was come to on the occasion referred to; and whether the understanding was still effectual.

The Parliamentary Secretary to the Ministry of Agriculture (Mr. W. R. Smith) said that there was clearly some misunderstanding as to the attitude attributed to the Ministry when the deputation in question was received in 1921. The records show that on that occasion certain suggestions were made which it was considered might assist retailers of small quantities of poultry food. It was also pointed out that new legislation would be required to meet the views of the deputation, but no ruling of the nature in question was given.

Director of Scientific Research

In reply to a question by Sir F. Sykes (House of Commons, July 18) the Under-Secretary of State for Air said that no appointment had yet been made to the post of Director of Scientific Research in connection with the Royal Air Force, owing to certain difficulties which have arisen in regard to the appointment.

From Week to Week

REPORTS FROM BERLIN state that Moechster dyeworks have been closed down.

THE AMERICAN PETROLEUM INSTITUTE'S estimate of the production of crude oil in the United States during the week ending July 12 was 13,949,000 barrels.

A TENDER FOR £495, by the Becco Engineering and Chemical Co. for the erection of a zeolite pressure softening plant has been accepted by Coventry Board of Guardians.

THE LIBRARY OF THE CHEMICAL SOCIETY will be closed for stocktaking from August 4 to August 16 inclusive, and will close each evening at 5 o'clock from August 18 to September 13.

M. OMER DENIS, the burgomaster of Forest, near Brussels, who visited Port Sunlight last week, started the first boiling of soap at Lever Bros.' works at Forest when they were opened in 1905.

BRITISH MANUFACTURES of machinery are better represented than previously at the fourth Latvian industrial exhibition, which opened this week, but they are still behind German and French exhibits.

MR. L. P. O'BRIEN has left the service of Joseph Crosfield and Sons, Ltd., of Warrington, and on August 1 will take up an appointment with B. Laporte, Ltd., as assistant to the chairman and managing director.

MR. H. E. PURKS, chairman of B. Hepworth and Co., Ltd., chemical manufacturers, of Kidderminster and Cleckheaton, has received a presentation from employees on completing 25 years' association with the firm.

A NEW EDITION of Schultz's *Farbstofftabellen* which has just been issued ignores the products of British and American dyestuff makers. The list of German dyes put on the market since 1914 is also not a very long one.

THE DEATH IS ANNOUNCED from Germany of Dr. Heinrich Precht. In 1882 he erected the first potassium-chloride plant for the Gewerkschaft Neu Strassfurt. Dr. Precht, who was 72, retired from the potash industry in 1912.

A "MECHANICAL CANARY" is said to have been devised by Harvard Chemical Laboratories. It will replace live birds for detecting the presence of poisonous gases in such places as ships' holds, tunnels, submarines and trenches.

LONDON UNIVERSITY has conferred the degree of Master of Science on Mr. F. Jones, B.Sc., Lecturer in Chemistry at the Leicester Technical School. Mr. Jones has specialised in the study of the Leicestershire rocks and petroleum problems.

THE HONORARY DEGREE of Doctor of Laws has been conferred, by Edinburgh University, on Sir David Orme Masson, Emeritus Professor of Chemistry, Melbourne; and Professor Charles J. Marten, director of the Lister Institute of Preventive Medicine.

IT IS ANNOUNCED THAT Poynter, Sons and Macdonald, manufacturing chemists, of Glasgow and Greenock, have taken over the business of rubber tar soap formerly carried on at Huntershill, Bishopbriggs. The works had been silent for a year.

AS A RESULT of relaxation of the regulations governing the importation into Australia of German dyes, steps are being taken to ensure that no German dyes shall be shipped to the Dominion through Ireland, as it is no longer part of the United Kingdom.

APPLICATIONS ARE INVITED for the post of lecturer in chemistry at University College, Dundee. Preference will be given to specialists in physical chemistry. Applications (in triplicate) should be sent to the Secretary of the University before August 31.

DR. F. W. CROSSLEY HOLLAND, a fellow of the Chemical Society, and for many years a research chemist, recently broadcasted from London on the subject of "Science and the Criminal." Dr. Crossley Holland is also a Bachelor of Science and a barrister-at-law.

THE FOLLOWING AWARDS have been made at Manchester University:—Beyer Fellowship, Mr. J. B. M. Herbert; Mercer Scholarship in Chemistry, Mr. C. E. Marshall; Leblanc Medals (Electro-Chemistry), Mr. J. W. Cuthbertson; (Colouring Matters), Mr. T. Heap.

THE AVAMOKE PUMP CO., Haslemere, Surrey, have supplied one of their "Squeegee" pumps to the Admiralty. This pump has been at work for several months on one of H.M. ships. The company have also supplied a pump to the Board of Royal Engineers for pumping water for field purposes.

THE 1851 EXHIBITION SCHOLARSHIP for scientific research for 1924 has been awarded to Mr. G. I. Hoover, demonstrator in Chemistry at Toronto University. The scholarship is worth £250 a year, for a minimum of two years, and entitles the winner to carry on scientific research in Universities abroad.

AT BIRMINGHAM POLICE COURT, on July 21, three men were charged with breaking and entering the premises of Southall Bros. and Barclay, Ltd., manufacturing chemists, of Charford Mills, Alum Rock Road, Saltley, on July 10. The men, who pleaded not guilty, were committed for trial at the Quarter Sessions.

A FACTORY FOR THE MANUFACTURE of sugar from beet is being built at Colwick, near Nottingham. It will have a yearly capacity of 6,000 tons, capable of development up to 10,000 tons. This factory is the first of a series proposed in various parts of the country. Lord Weir and Lord Invernairn are interested in the enterprise.

THE VACANT PRINCIPALSHIP of the Northampton Polytechnic Institute, Clerkenwell, London, caused by the death of Dr. R. Mullineux Walmsley, has been filled by the appointment of Mr. S. C. Laws, M.A. (Cantab.), M.Sc. (Lond.) principal of the Wigan Mining and Technical College for the past nine years. The appointment is subject to the approval of the London County Council.

A MEETING OF CREDITORS of A. W. Brown, oil merchant, of 132, Whitechapel Road, London, E.1, was held on July 18 at Winchester House, Old Broad Street, London, E.C. The assets were estimated at £1,675 4s. 8d., leaving a deficiency of £2,067 7s. 10d. A proposal was agreed that unless an offer of composition secured to the satisfaction of a committee was arranged within six days the estate would be wound up in bankruptcy.

Demand for Chemical Plant

MELDRUMS, LTD., of Timperley, near Manchester, state that they have experienced a great demand for their fuel saving appliances, and orders have been received for 38 sets of forced draught furnaces and/or mechanical stokers during the past three months. These have been divided amongst various industries, including tar distillers (repeats), chemical manufacturers, timber works, sugar refiners, Indian salt works, collieries, breweries, gas works, steel works and ice works.

There has also been a great demand for plants for the disposal of refuse, and they have received orders during the above period for 20 of these plants, mainly for the disposal of dangerous refuse, some of them being for the utilisation of heat in boilers or water heaters.

Amongst their other manufactures orders have been received for five portable steam disinfectors for Crown agents and municipalities, a "Meldrum" motor road sweeper loader for the Sheffield Corporation, and several "Meldrum" motor car trailers for camping purposes.

There has been a continuous demand from chemical works, dye works, coke oven plants, gas works, etc., for acid resisting metal cocks and valves, agitators, ejectors, producer blowers, pumps, jacketed pans, and a benzol recovery and refining plant for dry cleaners.

Recent Wills

Mr. Alexander Travers Hawes, J.P., of Nigels, Chislehurst, Kent, a director of Brunner, Mond and Co., Ltd., and the Castner-Kellner Alkali Co., Ltd.	£91,724.
Mr. John McMurray, of Belhaven Terrace, Kelvinside, Glasgow, a director of the United Turkey Red Co., Ltd.	£32,866
Mr. Henry Heath Cochrane, of Eshwood Hall, Durham, a director of Cochrane and Co., Ltd.	£170,689
Mr. Alfred Wilson, of Edgbaston, Birmingham, Chemical Manufacturer	£32,964
Mr. Jonathan Pim Barrington, of Morehampton Road, Dublin, managing director of John Barrington and Sons, soap and candle manufacturers	£6,708
Mr. James Ogilvie, of 11, Bothwell Street, Glasgow, chemical merchant	£9,354
Mr. Bernard Frederick Laporte, The Bungalow, Harpenden, Herts, chairman and governing director of B. Laporte, Ltd.	£76,637

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Patent Literature

Abstracts of Complete Specifications

217,611. Ammoniacal Liquors, Distillation of. South Metropolitan Gas Co., P. Parrish and O. W. Weight, 709, Old Kent Road, London, S.E.15. Application date, December 18, 1922.

The object is to use more completely the heat available in the distillation system of the present types of ammonia plant. A multiple distillation plant is used for obtaining the free ammonia, each unit of which comprises a still and a saturator, the units being connected in series. The liquor then passes to a liming chamber, and then to the fixed ammonia plant. This avoids the disadvantages due to the interaction of carbon dioxide and lime in multiple unit stills in which the free and fixed ammonia are obtained concurrently. The apparatus comprises a series arrangement of distillation units, each consisting of a free still and a saturator. The permanent gases and steam pass from the saturator of each unit to the next free still. Additional steam may be supplied to any still, depending on the strength of the liquor undergoing distillation. The liquor from all the free stills passes to a liming chamber, and thence to a fixed still. The resistance to the flow of gases is minimised by employing a distillation unit of the non-sealed type, and the saturator used is of such a type as to ensure effective absorption of the ammonia with a small acid seal. The hot vapour from the saturator of the last unit of the multiple unit plant may be used for heating the gas liquor, and the liquor discharged from the fixed still may be employed to heat a feed water heater.

217,612. Aqueous Dispersion of Rubber, Balata or Gutta Percha, and Process of Producing the Same. W. B. Pratt, 28, Pine Street, Wellesley Hills, Wellesley, Norfolk Co., Mass., U.S.A. Application date, December 19, 1922.

When rubber, balata or gutta percha have been coagulated from the latex, it has usually been regarded as impossible to de-coagulate these substances without de-polymerisation, but in the present invention a process has been discovered by which the coagulated substances may be dispersed in an aqueous medium without de-polymerisation. The substance, such as crude rubber, is dissolved in a solvent of the aromatic or carbocyclic series such as benzol, xylol, toluol, mixed with a saponifiable agent such as a liquid fatty acid, or the glycerides of the fatty acids. The solution is gradually mixed with water containing a saponifying agent such as ammonia or a suitable amine, so that an emulsifying agent or ammonia soap is formed in the solution. The addition of water is continued until a change in phase occurs, the water constituting the continuous phase and the rubber and its solvent the disperse phase of the emulsion. The volatile solvent may then be evaporated for use again. The character of the soap which is used as the emulsifying agent must be such that it does not cause the agglomeration or coagulation of the dispersed rubber. It is found that a higher degree of dispersion is obtained by forming the soap *in situ* than by forming it separately and adding it to the water. The operation is conducted at a relatively low temperature, and the evaporation of the solvent is effected in a vacuum still at a temperature below 50° C. The emulsified rubber may be coagulated by adding acetic acid or other coagulant, by heating, or by agitation.

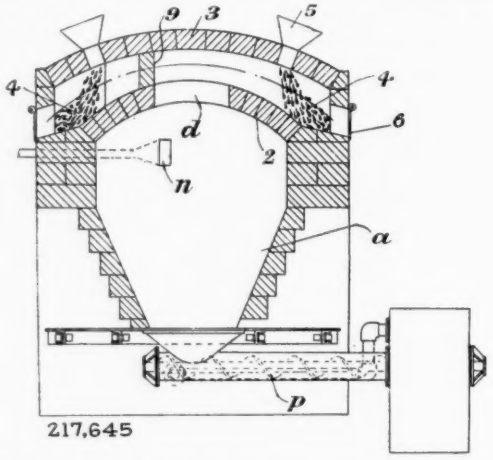
It is also possible to emulsify sulphur in the rubber emulsion for the subsequent vulcanisation of the rubber when coagulated. Resin or any other substance soluble in the rubber solvent may also be emulsified simultaneously. It is found that about 5–10 per cent. of oleic acid is sufficient to furnish enough soap for the dispersion of the rubber. The proportion of ammonia used is in excess of that required for the saponification of the oleic acid. The aqueous emulsions contained may be employed in the manufacture of all kinds of felted fabrics, such as paper, cardboard, boxboard, sheathing or roofing paper or felt, or leather board. When sulphur is emulsified with the rubber, the final sheet may be subjected to a vulcanising temperature.

217,613. Oil Gas, Production of. J. E. Hackford, 37, Mecklenburgh Square, London, W.C.1. Application date, December 19, 1922.

The process is for producing gas from heavy animal or vegetable or mineral oil without appreciable deposition of solid matter. The oil is mixed with air practically simultaneously with its discharge into a combustion chamber, and the mixture is partly burned and vaporised. The oil-spraying nozzle and the adjacent part of the combustion chamber are maintained by heat of combustion at such a temperature—*i.e.*, above 600° C.—that deposition of solid matter does not take place. When the gas output is not sufficient to maintain the necessary temperature at the inlet of the combustion chamber, the oil may be completely burned and the combustion products diverted. The hot combustion products may be caused to return and sweep over the fuel and air nozzle to obtain the necessary temperature. The carbon in the heavy residue is consumed as a fuel, but the temperature is not sufficiently high to decompose the methane.

217,645. Producing Gas from Powdered Carbonaceous Matter, Apparatus for. F. L. Duffield, Harboro' Rocks Farm, Brassington, Derbyshire. Application dates, March 19 and December 17, 1923.

A generator *a* of conoidal form is provided with an arched roof 2 having an outlet *d* for the gas. Powdered fuel and



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primary air are fed into the generator through one or more tangential inlets *n*, and the ash is discharged by a screw conveyor *p*. The fuel may be peat, lignite, charcoal or coal, and the temperature in the generator is maintained at 900°–1,200° C. The carbon and volatile matter are converted into gas by the circulation of the pulverised material with air in the generator, and sufficient time is given to produce a gas rich in carbon monoxide and hydrogen.

The gas is purified by causing it to impinge on hot coke 4, which is fed from hoppers 5 through the outer roof 3 on to the inner roof. At one side of each coke bed a baffle extends between the two roofs, and another baffle 9 partly surrounds the opening *d* to deflect the gases to the exit. Another form of generator is described in which secondary air is admitted to the space above the roof to burn the gas.

217,685. Regenerating Alkaline Liquors, Process for. J. d'Ans and Chemische Werke vorm. Auerges m.b.H. Kommanditges, 11–14, Ehrenbergstrasse, Berlin, O.17. Application date, April 6, 1923.

Alkaline lyes containing a large proportion of organic substances are usually regenerated by evaporating them, calcining, and causticising the alkali carbonate by means of quicklime. This process is not suitable when the lye contains only a small proportion of organic substances, and in this case the lye is heated with oxidising agents such as chlorates, hypochlorites, sodium nitrate or nitrite, or oxides of nitrogen, together with a catalyst. Suitable catalysts are the heavy metals and their oxides and salts. The oxidation may be promoted by introducing oxygen or oxides of nitrogen. In an example, lye containing 14 per cent. of caustic soda, together with substances derived from cellulose, is heated with sodium chlorate to 140°–180° C. for four hours, using copper wire netting as a catalyst. The alkali carbonate may be removed by causticising. The process is suitable for treating lyes obtained in mercerising and other processes for dealing with cellulose.

217,715. ALKYLOXYACRIDINES, MANUFACTURE OF. R. B. Ransford, London. From L. Cassella and Co., G.m.b.H., Frankfurt-on-Main, Germany. Application date, May 2, 1923.

It has been found that oxyacridines such as 3 : 6-dioxyacridine, 2 : 7-dimethyl-3 : 6-dioxyacridine, and others, may be treated with alkylating agents to convert them into *o*-alkylethers, without the alkylation of the nitrogen nucleus. In an example, 3 : 6-dioxyacridine is dissolved in water containing caustic soda, and dimethyl sulphate then added gradually until the solution is nearly neutral. More dimethyl sulphate and caustic soda are then added, and the 3 : 6-dimethoxyacridine is filtered off. The hydrochloride may be crystallised out from a solution in hot dilute hydrochloric acid. The mother liquor may be neutralised with acetic acid to obtain monoethyl ether of 3 : 6-dioxyacridine. Other examples are given of the production of 3 : 6-diethoxyacridine, 3 : 6-dimethoxy-2 : 7-dimethylacridine, and bisoxethyl-3 : 6-dioxyacridine. These substances are used for medical purposes.

217,753. CHLORINATED AMINES, MANUFACTURE OF. A. G. Bloxam, London. From Durand and Huguenin Soc. Anon., Basle, Switzerland. Application date, June 4, 1923.

Specification No. 193,843 and 198,676 (see THE CHEMICAL AGE, Vol. VIII, p. 494, and Vol. IX, p. 156) describe the production of highly chlorinated hydro aromatic products containing nitrogen. It is now found that these substances may be reduced to obtain chlorinated amines in such a manner that the whole of the nitrogen remains in the molecule. Strong reducing agents such as zinc and hydrochloric acid tend to remove chlorine, and it is preferred to use weaker reducing agents such as a solution of calcined sodium sulphide in ethyl or methyl alcohol, or alcohol alone. Good yields of chlorinated amines are obtained—*e.g.*, 2 : 3 : 4-trichloro-1-naphthylamine, 1 : 3-dichloro-2-naphthylamine, 2 : 3 : 4-trichloro-1-aminoanthraquinone, and a dichloro-1-amino-anthraquinone. It is also possible to produce from cheap materials, pentachloraniline, 2 : 3 : 4 : 6-tetrachloraniline, and 1 : 3 : 4-trichloro-2-naphthylamine. Examples are given of the treatment of (1) hexachloro-chloroketimino-tetrahydrobenzene to obtain the tetrachloraniline; (2) octochloro-chloroketimino-hexahydrobenzene to obtain pentachloroaniline; (3) pentachloro-β-chloroketimino-tetrahydronaphthaline to obtain 1 : 3 : 4-trichloro-β-naphthylamine; (4) the α-chlorketimino derivative to obtain 2 : 3 : 4-trichloro-α-naphthylamine; (5) pentachloro-β-chloroketimino-tetrahydronaphthaline to obtain 1 : 3-dichloro-β-naphthylamine; (6) pentachloro-α-chloroketimino-tetrahydroanthraquinone to obtain 2 : 3 : 4-trichloro-α-amino-anthraquinone; (7) pentachloro-α-chloroketimino-tetrahydroanthraquinone to obtain dichlor-α-amino-anthraquinone.

217,770. TREATING STARCH FOR THE PRODUCTION OF MALTOSE AND OTHER SUBSTANCES, PROCESS OF. A. R. Ling and D. R. Nanji, The University, Edmund Street, Birmingham. Application date, June 28, 1923.

Starch granules are usually considered to consist of an internal portion of amylose with an external covering of amylopectin. The amylose is soluble in water, gives a blue coloration with iodine, and is converted into maltose under the influence of malt diastase. The amylopectin is insoluble in cold water. These substances are separated by freezing starch paste, whereby the amylopectin and amylose are separated out, and the amylose may then be dissolved out by treating with water or dilute alkali—*e.g.*, 1 per cent. sodium carbonate, at 50°–60° C. When maltose is required, the frozen starch paste is treated with diastase prepared from cereals to convert the amylose into maltose, leaving the amylopectin unchanged. The maltose is then dissolved out with water. Alternatively, the starch paste may first be treated with diastase, and the product frozen, and the maltose washed out. The maltose obtained is crystalline and non-hygroscopic.

217,817. WET MAGNETIC SEPARATION OF MATERIAL BY MEANS OF ROLLER OR CYLINDER SEPARATORS, PROCESS FOR. P. C. Rushen, London. From F. Krupp Akt.-Ges. Grusonwerke, Madgeburg-Buckau, Germany. Application date, October 9, 1923.

In a roller separator employing a film of liquid on the roller, within which the magnetic material is drawn to the separating surface, the magnetic material usually travels through only that part of the roller surface which is moving upwards. In this invention the part of the roller surface which is moving downwards is subjected to a spray of the film liquid, which flows downwards to form the film between the current of pulp and the separating surface.

NOTE.—Abstracts of the following specifications, which are now accepted, appeared in THE CHEMICAL AGE when they became open to inspection under the International Convention:—193,420 (F. Pollak), relating to the manufacture of condensation products from formaldehyde and urea or thiourea and its derivatives, see Vol. VIII, p. 466; 205,790 (Farbenfabriken vorm. F. Bayer and Co.) relating to the manufacture of new indigoid dyestuffs, see Vol. IX, p. 693; 212,533 (L'Air Liquide Soc. Anon. pour l'Etude et l'Exploitation des Procédés G. Claude) relating to a process for the separation of gaseous mixtures, see Vol. X, p. 496.

International Specifications not yet Accepted

215,789. SYNTHETIC AMMONIA. Brunner, Mond and Co., Ltd., Winnington, Northwich, Cheshire. (Assignees of F. W. de Jahn, Manhattan, New York. International Convention date, May 12, 1923.

The nitrogen and hydrogen used for the synthesis of ammonia are purified by passing them under pressure through anhydrous liquid ammonia. Water and carbon compounds are thus removed. If the ammonia produced by synthesis is separated by liquification, the gas to be purified may be passed through the liquefied gas before passing into the synthesising chamber. This method contaminates the liquid ammonia, and if this is not desired, a separate vessel containing liquid ammonia may be provided. This method is applicable to the synthesis of ammonia from a crude mixtue of hydrogen, nitrogen, and carbon monoxide at a pressure of 95 atmospheres by the de Jahn process.

215,790. SULPHURIC ACID. Metal Traders Technical, Ltd., 7, Gracechurch Street, London. (Assignees of Metallbank und Metallurgische Ges., 45, Bockenheimer Anlage, Frankfurt-on-Main, Germany. International Convention date, May 11, 1923.

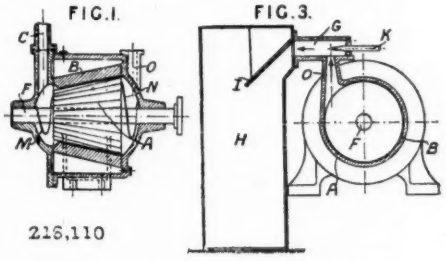
A sulphuric acid concentrating plant is heated by sulphur burners, and also by hot gases from pyrites burners after passing through an electrical gas purifier. The waste gases are converted into sulphuric acid by the process described in specification 213,895 (see THE CHEMICAL AGE, Vol. X, p. 629).

216,098. ALKALINE EARTH ARSENATES. Soc. Chimique des Usines du Rhône, 21, Rue Jean Goujon, Paris. International Convention date, May 15, 1923.

An alkaline earth arsenite is made by boiling an alkaline earth hydroxide, *e.g.*, lime with arsenious acid, and the arsenite is then heated to about 450° C. in a gas containing free oxygen, to obtain the alkaline earth arsenate.

216,110. DISINTEGRATING MILLS. W. Ostermann, Oschersleben, Germany. International Convention date, May 18, 1923.

A mill for reducing solid suspensions in liquid to a colloidal state comprises a conical runner A rotating at high speed



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within a conical casing B, both being provided with straight or helical grooves. Helical blades, M, N are provided to direct the mixture into and out of the mill. The colloidal solution passes out through an outlet O and is atomised by hot compressed air from a nozzle K. The mixture impinges against an inclined baffle plate I, and is dried in falling through a chamber H, yielding a solid dry colloidal substance.

216,109. Arsenic Ores, Treating. J. C. Jouvenet, Zlatna, Roumania, and C. Mohr, 36, Rue de Savigne, Paris. International Convention date, May 15, 1923.

Arsenical ores such as mispickel are mixed with sodium carbonate and manganese dioxide, and heated in presence of oxygen. Sodium arsenate is thus obtained by leaching the product. Alternatively, the ore may be heated and the vapour condensed to obtain arsenious acid. The ore is then treated in an autoclave with superheated steam, calcium chloride solution, and sufficient silica to combine with the calcium and iron. Chlorides of silver and gold are thus obtained.

216,120. Ketones. Soc. Lefranc et Cie, 43, Rue de Provence, Paris. International Convention date, May 17, 1923.

Calcium butyrate is obtained from the butyric fermentation of sugars, glucosides, polysaccharides, amino-acids, etc., in presence of calcium carbonate. The product contains small proportions of calcium acetate and propionate. The dry calcium butyrate is then heated in a retort with an inert substance such as sand or dry clay to 300°–400° C. and dipropylketone is obtained as a condensate. The residue of calcium carbonate and sand or clay may be used for cement making. Dipropylketone is a fuel for internal combustion engines.

216,129. Hydrochloric Acid. E. Schmidt, 136, Oppauerstrasse, Waldhof, Mannheim, Germany, and Ges. für Chemische Produktion, 156, Sandhoferstrasse, Waldhof, Mannheim, Germany. International Convention date, May 14, 1923.

Hydrochloric acid solution is shaken with active charcoal manufactured from sulphite waste lye, and then filtered. Arsenic and iron impurities are thereby removed.

216,130. Decolorising Carbon. H. Müller-Clemm, 23, Gutenbergstrasse, and Ges. für Chemische Produktion, 156, Sandhoferstrasse, both in Waldhof, Mannheim, Germany. International Convention date, May 14, 1923.

To obtain decolorising carbon, a mixture of sulphite cellulose, waste lye and potassium sulphide, with or without carbonate, is carbonized and leached with water. The lye thus obtained may be used again for sulphite cellulose.

216,138. Disinfectants and Insecticides. C. F. Weber Akt-Ges., 31, Nounenstrasse, Plagwitz, Leipzig, and A. Braentigam, 4, Aurclienstrasse, Lindenau, Leipzig, Germany. International Convention date, May 14, 1923.

Disinfectants, fungicides, and insecticides are obtained by distilling tar oils at 230°–300° C., which are obtained by the low temperature distillation of coal. These fractions contain di- and tri-methyl phenols, di-hydroxy and poly-hydroxy phenols, and resinous substances which assist emulsification with water.

216,140. Obtaining Light Oils from Distillation Gases. Gelsenkirchener Bergwerks-Akt.-Ges. Abteilung Schalke, and H. Hock, 6, Walpungisstrasse, Gelsenkirchen, Germany. International Convention date, May 16, 1923.

Coal is distilled at low temperature, and the gas is treated with a solvent such as acetone at increased pressure and reduced temperature to obtain hydrocarbons of the olefine and paraffin series. The solution is heated or the pressure reduced to obtain these gases, which are then condensed to form a liquid fuel. The absorbent may be used again.

216,475. Cellulose Solutions. L. Lilienfeld, 1, Zeltgasse, Vienna. International Convention date, May 25, 1923.

Cellulose, or a cellulose conversion product is treated with an ammonia derivative of carbon dioxide or of a sulphur derivative of carbon dioxide in the presence of aqueous alkali. Suitable derivatives are thiourea, guanidine, dicyandiamide, and α-α-dichlorisopropyl-alcohol-carbamic acid ester. The starting material may be cellulose comminated with water or treated with oxidizing or reducing agents, or heated alone or with water, glycerine, or salts. Alkali cellulose, or solutions in cuprammonia, zinc salts, sulphuric acid, phosphoric acid, hydrochloric acid or arsenic acid, hydrocelluloses, oxycelluloses, etc., may also be used. The reaction may be conducted at 0° to –15° C., with an alkali of 2–16 per cent. strength and 2–10 per cent. of the carbon dioxide derivative. The solutions obtained are used in the manufacture of artificial silk, etc.

Latest Notifications.

218,972. Process for obtaining products suitable for metallurgical treatment from zinc chloride solutions. Nathansohn, Dr. A. July 9, 1923.

218,982. Use of medicaments insoluble or sparingly soluble in water. Society of Chemical Industry in Basle. July 14, 1923.

218,992. Process for the production of catalysts for the synthesis of ammonia. Norsk Hydro-Elektrisk Kvaelstofaktieselskabet. July 14, 1923.

218,995. Centrifugal pumps. Nash Engineering Co. July 9, 1923.

219,024. Process of separating hafnium and zirconium. Naamlooze Vennootschap Philips' Gloeilampenfabrieken.

Specifications Accepted with Date of Application

199,354. Diphenylguanidine, Process for the manufacture of Naugatuck Chemical Co. June 19, 1922.

199,721. Amino-perylene-quinones, Process of manufacturing. H. Pereira. June 20, 1922.

202,616. Centrifugal Separators. Aktiebolaget Separator. Aug. 16, 1922.

206,848. *p*-cymene from monocyclic terpenes, Process for the production of. G. Austerweil and L. Peufaillit. Nov. 8, 1922.

214,572. Crystallisation processes. Appareils & Evaporateurs Kestner. April 17, 1923.

210,742. Pure anthracene and carbazol from crude anthracene, Process of obtaining. L. Weil and Chemische Fabrik in Billwarder vorm. Hell F. Sthamer Akt.-Ges. January 30, 1923. Addition to 172,996.

214,576. Electro osmotic purification of glycerin, Process for. Elektro Osmose Akt.-Ges. (Graf Schwerin Ges.). April 18, 1923.

214,579. Electro osmotic purification of glue or gelatine, Process for. Elektro Osmose Akt.-Ges. (Graf Schwerin Ges.). April 18, 1923.

218,347. Hyposulphurous acid, Production of. A. Worsley. February 3, 1923.

218,354. Electrostatic separation of particles. South Metropolitan Gas Co., Woodall, Duckham & Jones (1920) Ltd., and H. S. Hatfield. March 3, 1923.

218,373. Sodium, Manufacture of. T. Ewan. April 3, 1923.

218,385. Treating liquor accruing from the lixiviation of vegetable matter, Process of. L. J. B. A. Colas, A. P. J. Colas, and L'Alfa, Soc. Anon, pour la Fabrication des Pates de Cellulose. April 4, 1923. Addition to 200,482.

218,414. Nitration of cellulose. H. V. Walker. April 17, 1923.

218,447. Filtering apparatus. E. W. W. Keene. May 24, 1923.

218,458. Separating alkylamines from ammonia and other gases. A. G. Green, H. F. Oxley, and British Dyestuffs Corporation, Ltd. June 1, 1923.

218,512. Carbonisation of bituminous coal and like materials. Humphreys & Glasgow, Ltd. (*J. M. Rusby.*) August 2, 1923.

218,542. Acridinium compounds, Production of. R. B. Ransford. (*L. Cassella & Co., Ges.*) October 30, 1923.

218,544. Concentrating latex or similar materials, Process and apparatus for. General Rubber Co. July 11, 1923.

218,563. Alkali metals, Manufacture of. T. Ewan. April 3, 1923.

218,568. Azo dyestuffs, Manufacture of. A. G. Bloxam. (*Chemische Fabrik Griesheim Elektron.*) December 13, 1923.

218,606. Sodium or potassium, Manufacture of. T. Ewan. April 3, 1923.

Applications for Patents

Akt.-Ges. für Anilin-Fabrikation and Bloxam, A. G. Manufacture of dyestuffs. 16,954. July 15.

Battersby, J. W., Chemical Engineering Co. (Manchester), Ltd., and Spensley, J. W. Separation of oils or fats. 17,053. July 16.

Clark, G. M., and Knoll and Co. Chemische Fabrik. Manufacture of double compounds of dimethylxanthines, earth alkali and salicylic acid. 16,886. July 14.

Dwight and Lloyd Metallurgical Co. Machines for treating ores, etc. 17,160. July 17.

Fairweather, H. G. C. and National Aniline and Chemical Co., Inc. Production of *o*-nitranisole. 16,920. July 15.

Farbenfabriken vorm. F. Bayer and Co., and Ransford, R. B. Manufacture of dyestuffs. 17,300. July 18.

Hempel, H. Ammonia refrigerators. 17,295. July 18.

Howles, F., and McDougall, I. Manufacture of insecticides, sheep dips, etc. 17,361. July 19.

Jansen, H. J. Distillation and/or cracking of hydrocarbon oils. 17,253. July 18.

Lush, E. J., and Technical Research Works, Ltd. Production of metallic catalysts. 17,061. July 16.

Millar, J. T., and Williams, J. G. Preparation of water-soluble phosphate salts. 17,025. July 16.

Naamlooze Vennootschap Philips' Gloeilampenfabrieken. Separating hafnium and zirconium. 17,203. July 17. (Denmark, July 18, 1923.)

Naamlooze Vennootschap Philips' Gloeilampnefabrieken. Separating hafnium and zironium. 17,309. July 18. (Denmark, August 25, 1923.)

Steffens, J. A. Dehydration of alcohol. 17,261. July 18. (United States, August 16, 1923.)

London Chemical Market

The following notes on the London Chemical Market are specially supplied to THE CHEMICAL AGE *by Messrs. R. W. Greeff & Co., Ltd., and Messrs. Chas. Page & Co., Ltd., and may be accepted as representing those firms' independent and impartial opinions.*

London, July 23, 1924.

WHILST business is still largely of the hand to mouth variety, activity has been greater than for some considerable time past, and the feeling in regard to the second half of the year is becoming more optimistic. Export inquiry is only moderate.

General Chemicals

ACETONE is very firm and the trend of price is still upwards.

ACID ACETIC is lower in price, and the technical quality can be bought to-day at £43 10s. per ton carriage paid, whilst the pure is £43 per ton, ex wharf.

ACID CITRIC is still quiet, price nominally 1s. 5½d. to 1s. 6d., less 5%.

ACID FORMIC is decidedly firmer, and the price for 85% is £55 10s., carriage paid to station.

ACID LACTIC is unchanged and the demand is nominal.

ACID OXALIC.—Lower prices seem to be unlikely, and the upward tendency is developing. The price to day is 4½d., ex wharf.

ACID TARTARIC is now in steady demand. The English makers quote 1s. 1½d., less 5%, with foreign slightly cheaper.

ALUM.—The foreign makers' prices have been reduced and demand is fairly good.

ARSENIC still favours buyers. Demand is poor. Price about £45 per ton.

BARIUM CHLORIDE is easy in tone, but any improvement in demand would affect the price very quickly. Price to-day £13 10s. to £14 per ton.

COPPER SULPHATE.—Unchanged.

CREAM OF TARTAR is a fairly active market. Price is a little easier and to-day's quotation is £83 per ton, less 2½%.

CALCIUM CHLORIDE is in good demand, price about £5 per ton.

EPSOM SALTS.—Market is very strong, the shortage on the Continent being acute. Price is £4 15s. to £5 per ton.

FORMALDEHYDE is again inclined to sag in price, the nominal figure is £54 per ton, but this price can be shaded for quantities.

LEAD ACETATE is in good demand. English makers quote £48, foreign a little cheaper.

LIME ACETATE is offered at very low figures from the Continent, the tendency is easier.

POTASSIUM CARBONATE is very quiet, price £23 to £24 per ton.

POTASSIUM BICHROMATE is very quiet, with little doing at the English makers' price.

POTASSIUM PERMANGANATE is slow of sale. Business is reported as low as 7½d. per lb.

POTASSIUM PRUSSIATE is in better demand. Price nominally 8d. per lb., but an improvement is not unlikely.

SODIUM ACETATE.—In short supply for the next few months at £23 15s. per ton to £24 per ton.

SODIUM BICHROMATE.—Tendency is rather weak, both English and foreign quote to-day 4¼d, less 5%.

SODIUM HYPOSULPHITE.—Unchanged. £9 15s. to £10 per ton.

SODIUM NITRITE is in good demand at £26 10s. to £27 per ton.

SODIUM PRUSSIATE.—Operators are inclined to hold off in view of the improving tendency. To-day's quotation is 4⅜d. to 4½d.. per lb.

SODIUM SULPHIDE.—Unchanged at about £14 per ton.

Coal Tar Products

There is little change in the market for coal tar products since last week, business still being rather quiet.

90% BENZOL is quoted at from 1s. 6d. to 1s. 6½d. per gallon on rails.

PURE BENZOL shows no change, and is stationary at 1s. 11d. per gallon on rails.

CREOSOTE OIL continues to be very weak, and is offered at prices varying from 5½d. to 6d. per gallon on rails in the North, while the price in London remains steady at 6¾d. per gallon.

CRESYLIC ACID shows no change from last week, there still being very little demand. It is quoted at 2s. to 2s. 1d. per gallon f.o.r. for the pale quality 97/99%, and the dark quality 95/97% at 1s. 9d. per gallon on rails.

SOLVENT NAPHTHA.—There are fair quantities of this product offering, and it is worth 11½d. per gallon on rails.

HEAVY NAPHTHA remains unchanged at 1s. 2d. per gallon on rails.

NAPHTHALENES.—There is no change to report from last week. Supplies of the higher grade 76/78 quality are plentiful, whilst there are no orders in the market. It can be obtained at about £7 10s. per ton, and the 74/76 quality at 10s. per ton less. The low grade naphthalene remains steady at about £5 per ton.

PITCH.—There are no new features to report.

Sulphate of Ammonia

SULPHATE OF AMMONIA.—The demand remains unsatisfactory.

Nitrogen Products Market

SINCE July 16 there has been no change in the export market, the demand having been steady with prices at £13 15s. to £14 per ton, c.i.f. Spain, and £14 10s. per ton c.i.f. Canary Islands. The f.o.b. value for shipment to the Colonies remains at £13 to £13 5s. per ton.

There is no change to report in the home agricultural position. It is expected, however, that prices for September and October will be announced in about a month's time.

The nitrate of soda market has continued to decline and for spot delivery the price is now £11 10s. to £11 12s. 6d. per ton, c.i.f. chief European ports. The quantity sold for shipment after July 1, 1924, now amounts to about 1,325,000 tons.

Ramsay Memorial Fellowships

THE Ramsay Memorial Fellowship Trustees have made the following awards of new Fellowships for the session 1924-25 :—A British Fellowship of £300 to Mr. S. W. Saunders, B.Sc., for work at University College, London; a Glasgow Fellowship of £300 to Mr. Alex. Robertson, M.A., B.Sc., for work in the University of Manchester; a Danish Fellowship of the value of £229 to Mr. Kai Julius Pedersen, for work in the University of Bristol. The Trustees have renewed the following Fellowships for the same session :—Dr. Samuel Coffey (British Fellowship), for work at University College, London; Dr. Alan Titley (British Fellowship), for work in the University of Oxford; Mr. Thomas S. Stevens (Glasgow Fellowship), for work in the University of Oxford; Dr. Miguel Crespi (Spanish Fellowship), for work at University College, London; Dr. J. Kalff (Netherlands Fellowship), for work in the University of Manchester; Dr. H. Weiss (French Fellowship), for work in the Davy Faraday Laboratory, Royal Institution; Dr. Edward Boomer (Canadian Fellowship), for work in the University of Cambridge.

Sir Robert Robertson, K.B.E., F.R.S., has been appointed a member of the Ramsay Memorial Advisory Council, *vice* Sir James Dobbie (deceased.)

Patent Extension Petition

MR. JUSTICE TOMLIN on Monday, July 21, had before him the petition of the Oil Refining Improvements Co., Ltd., of West George Street, Glasgow, for an extension of the time of a patent relating to "improvements in the treatment of mineral and vegetable oils." The term expires on August 8 next.

Mr. Moritz, for the company, said they owned the world rights of the patent, excepting India and Persia. The patent was for an improved process for the decolorisation and desulphurising of oils, with particular reference to petroleum oils. It superseded the old and expensive sulphur process. The inventors, now dead, discovered that there were great advantages to be gained by using bauxite, a finely coloured alumina, through which the oil was passed, in that the bauxite could be used over and over again, and that this process involved no loss whatever in the oils under treatment. The patent was one of the greatest importance in connection with the petroleum industry, and it was now being tried out on a large scale by the Anglo-Persia Oil Co., Ltd. The case was adjourned for a week to enable the further particulars to be presented.

Weekly Prices of British Chemical Products

The prices and comments given below respecting British chemical products are based on direct information supplied by the British manufacturers concerned. Unless otherwise qualified, the figures quoted apply to fair quantities, net and naked at sellers' works.

General Heavy Chemicals

All grades of Boric Acid have been reduced by £3 per ton as from June 11. Borax prices remain unchanged. Prices remain generally steady.

Acid Acetic 40% Tech.—£23 10s. per ton.

Acid Boric, Commercial.—Crystal, £45 per ton. Powder, £47 per ton

Acid Hydrochloric.—3s. 9d. to 6s. per carboy d/d., according to purity, strength and locality.

Acid Nitric 80° Tw.—£21 10s. to £27 per ton, makers' works, according to district and quality.

Acid Sulphuric.—Average National prices f.o.r. makers' works, with slight variations up and down owing to local considerations: 140° Tw., Crude Acid, 65s. per ton. 168° Tw., Arsenical, £5 10s. per ton. 168° Tw., Non-arsenical, £6 15s. per ton.

Ammonia Alkali.—£6 15s. per ton f.o.r. Special terms for contracts.

Bleaching Powder.—Spot, £11 d/d.; Contract, £10 d/d. 4 ton lots.

Bisulphite of Lime.—£7 per ton, packages extra.

Borax, Commercial.—Crystal, £25 per ton. Powder, £26 per ton. (Packed in 2-cwt. bags, carriage paid any station in Great Britain.)

Calcium Chloride.—£5 17s. 6d. per ton d/d.

Methylated Spirit 64 O.P.—Industrial, 3s. 1d. to 3s. 5d. per gall. Mineralised, 4s. 2d. to 4s. 6d. per gall., in each case according to quantity.

Potash Caustic.—£30 to £33 per ton.

Potassium Bichromate.—5½d. per lb.

Potassium Chlorate.—3d. to 4d. per lb.

Salammoniac.—£32 per ton d/d.

Salt Cake.—£3 10s. per ton d/d.

Soda Caustic, Solid.—Spot lots delivered, £16 7s. 6d. to £19 7s. 6d. per ton, according to strength; 20s. less for contracts.

Soda Crystals.—£5 5s. to £5 10s. per ton ex railway depots or ports.

Sodium Acetate 97/98%.—£24 per ton.

Sodium Bicarbonate.—£10 10s. per ton carr. paid.

Sodium Bichromate.—4½d. per lb.

Sodium Bisulphite Powder 60/62%.—£18 to £19 per ton according to quantity, f.o.b., 1-cwt. iron drums included.

Sodium Chlorate.—3d. per lb.

Sodium Nitrate refined 96%.—£13 5s. to £13 10s. per ton, ex Liverpool. Nominal.

Sodium Nitrite 100% basis.—£27 per ton d/d.

Sodium Sulphide conc. 60/65.—About £14 10s. per ton d/d.

Sodium Sulphide Crystals.—£9 per ton d/d.

Sodium Sulphite, Pea Crystals.—£15 per ton f.o.r. London, 1-cwt. kegs included.

Coal Tar Products

Prices in this section show some irregularity, according to district. In the north-eastern counties, for instance, anthracene oil, solvent naphtha, and naphthalenes are cheaper than in Lancashire or London. On the other hand, crude carbolic and creosote are dearer.

Acid Carbolic Crystals.—6½d. to 6¾d. per lb. Fair inquiry. Crude 60's, 1s. 9d. to 2s. per gall., according to district. Still quiet but slightly firmer.

Acid Cresylic 97/99.—2s. 1d. to 2s. 2d. per gall. Demand still good. Market firm. Pale 95%, 1s. 10d. to 1s. 11d. per gall. Steady demand. Dark, 1s. 10d. to 1s. 11d. per gall. Steady business.

Anthracene Paste 40%.—4d. per unit per cwt. Nominal price. No business.

Anthracene Oil, Strained.—8½d. to 9½d. per gall. Quiet. Unstrained, 7½d. to 8¼d. per gall.

Benzol.—Crude 65's.—10½d. to 1s. per gall., ex works in tank wagons. Standard Motor, 1s. 4½d. to 1s. 6d. per gall., ex works in tank wagons. Pure, 1s. 8½d. to 1s. 10d. per gall., ex works in tank wagons.

Toluol.—90%, 1s. 5½d. per gall. Pure, 1s. 8d. to 2s. per gall.

Xylol Commercial.—2s. 3d. per gall. Pure, 3s. 3d. per gall.

Creosote.—Cresylic, 20/24%, 9d. to 9½d. per gall. Few inquiries. Middle Oil, Heavy, 5½d. to 6d. per gall. in Lancashire. Standard specification, 6d. to 8d. per gall. in Yorkshire.

Naphtha.—Crude, 8d. to 9d. per gall. Solvent 90/160, 1s. 1d. to 1s. 4d. per gall. Fair business passing. Solvent 90/190, 1s. to 1s. 2d. per gall. Fair business passing.

Naphthalene Crude.—Drained Creosote Salts, £4 to £6 10s. per ton. Quiet. Whizzed or hot pressed, £9 per ton. Little business.

Naphthalene.—Crystals and Flaked, £13 to £17 per ton in Yorkshire and London respectively. Market quiet.

Pitch.—Medium soft, 52s. 6d. to 60s. per ton, f.a.s. for next season. Frequent inquiries.

Pyridine.—90/160, 19s. to 20s. per gall. Market less firm. Heavy, 12s. to 12s. 6d. Little business.

Intermediates and Dyes

There has been a fair demand for dyestuffs during the past week. Prices remain constant. A number of intermediate products have been reduced in price.

In the following list of Intermediates delivered prices include packages except where otherwise stated.

Acetic Anhydride 95%.—1s. 7d. per lb.

Acid H.—4s. per lb. 100% basis d/d.

Acid Naphthionic.—2s. 4d. per lb. 100% basis d/d.

Acid Neville and Winther.—5s. 8d. per lb. 100% basis d/d.

Acid Salicylic, technical.—1s. 1d. per lb. Improved demand.

Acid Sulphanilic.—9½d. per lb. 100% basis d/d.

Aluminium Chloride, anhydrous.—1s. per lb. d/d.

Aniline Oil.—7¾d. to 8¼d. per lb. naked at works.

Aniline Salts.—7¾d. to 9d. per lb. naked at works.

Antimony Pentachloride.—1s. per lb. d/d.

Benzidine Base.—4s. 6d. per lb. 100% basis d/d.

Benzyl Chloride 95%.—1s. 1d. per lb.

p-Chlorphenol.—4s. 3d. per lb. d/d.

p-Chloraniline.—3s. per lb. 100% basis.

o-Cresol 19/31° C.—4½d. per lb. Demand steady.

m-Cresol 98/100%.—2s. 1d. to 2s. 3d. per lb. Demand moderate.

p-Cresol 32/34° C.—2s. 1d. to 2s. 3d. per lb. Demand moderate.

Dichloraniline.—2s. 3d. to 3s. per lb.

Dichloraniline S. Acid.—2s. 6d. per lb. 100% basis.

p-Dichlorbenzol.—£85 per ton.

Diethylaniline.—4s. 7d. per lb. d/d., packages extra, returnable.

Dimethyaniline.—2s. 4d. per lb. d/d. Drums extra.

Dinitrobenzene.—9d. per lb. naked at works.

Dinitrochlorbenzol.—£84 10s. per ton d/d.

Dinitrotoluene.—48/50° C. 8d. to 9d. per lb. naked at works. 66/68° C. 1s. 2d. per lb. naked at works.

Diphenylaniline.—2s. 11d. per lb. d/d.

Monochlorbenzol.—£63 per ton.

B-Naphthol.—1s. 1d. per lb. d/d.

a-Naphthylamine.—1s. 4½d. per lb. d/d.

B-Naphthylamine.—4s. per lb. d/d.

m-Nitraniline.—5s. 3d. per lb. d/d.

p-Nitraniline.—2s. 3½d. per lb. d/d.

Nitrobenzene.—5½d. to 5¾d. per lb. naked at works.

o-Nitrochlorbenzol.—2s. per lb. 100% basis d/d.

Nitronapthalene.—11d. per lb. d/d.

p-Nitrophenol.—1s. 9d. per lb. 100 % basis d/d.

p-Nitro-*o*-amido-phenol.—4s. 6d. per lb. 100% basis.

m-Phenylene Diamine.—4s. per lb. d/d.

p-Phenylene Diamine.—10s. 3d. per lb. 100% basis d/d.

R. Salt.—2s. 6d. per lb. 100% basis d/d.

Sodium Naphthionate.—2s. 3d. per lb. 100% basis d/d.

o-Toluidine.—8½d. per lb.

p-Toluidine.—3s. 6d. per lb. naked at works.

m-Toluylene Diamine.—4s. 3d. per lb. d/d.

Wood Distillation Products

All prices keep fairly stable, but there is room for improvement in business.

Acetate of Lime.—Brown, £14 10s. per ton d/d. Demand active. Grey, £19 to £20 per ton. Fair demand. Liquor, 9d. per gall. 32° Tw.

Charcoal.—£7 5s. to £9 per ton, according to grade and locality. Demand below normal.

Iron Liquor.—1s. 7d. per gall. 32° Tw. 1s. 2d. per gall. 24° Tw.

Red Liquor.—10d. to 1s. per gall. 14/15° Tw.

Wood Creosote.—2s. 7d. per gall. Unrefined.

Wood Naphtha, Miscible.—5s. per gall. 60% O.P. Market dull. Solvent, 5s. 6d. per gall. 40% O.P. Fairly good demand.

Wood Tar.—£5 per ton.

Brown Sugar of Lead.—£46 per ton.

Rubber Chemicals

Antimony Sulphide.—Golden, 5¾d. to 1s. 4d. per lb., according to quality. Crimson, 1s. 3d. to 1s. 6d. per lb., according to quality.

Arsenic Sulphide, Yellow.—1s. 11d. per lb.

Barytes.—£3 10s. to £6 15s. per ton, according to quality.

Cadmium Sulphide.—3s. 9d. per lb.

Carbon Bisulphide.—£24 to £26 per ton, according to quantity.

Carbon Black.—7d. per lb., ex-wharf, Dearer.

Carbon Tetrachloride.—£56 per ton, drums free.

Chromium Oxide, Green.—1s. 3d. per lb.

Indiarubber Substitutes, White and Dark.—4¾d. to 6¼d. per lb. Demand very brisk. Prices likely to remain steady owing to firmness of rapeseed oils.

Lamp Black.—45s. per cwt., barrels free.

Lead Hyposulphite.—7½d. per lb.
Lithopone, 30%.—£22 10s. per ton.
Mineral Rubber "Rubpron."—£15 10s. per ton f.o.r. London.
Sulphur.—£10 to £12 per ton, according to quality.
Sulphur Chloride.—3d. per lb., carboys extra.
Thiocarbanilide.—2s. 6d. per lb.
Vermilion, Pale or Deep.—4s. 10d. per lb.
Zinc Sulphide.—7½d. to 1s. 8d. per lb., according to quality.

Pharmaceutical and Photographic Chemicals

The demand for Pharmaceutical Chemicals is better for export to the British Dominions than for the Home Trade.
Acid, Acetic 80% B.P.—£45 per ton.
Acid, Acetyl Salicylic.—3s. 3d. Very heavy demand. Price firm.
Acid, Benzoic B.P.—3s. 6d. per lb. Larger supplies available.
Acid, Boric B.P.—Crystal £51 per ton, Powder £55 per ton. Carriage paid any station in Great Britain.
Acid, Camphoric.—19s. to 21s. per lb.
Acid, Citric.—1s. 6½d. per lb., less 5% for ton lots. Market extremely firm. Upward tendency.
Acid, Gallic.—3s. per lb. for pure crystal.
Acid, Pyrogallic, Crystals.—7s. per lb. for 1 cwt. lots. Market firm; increasing demand.
Acid, Salicylic.—1s. 6d. to 1s. 8d. per lb. Low prices have stimulated more inquiry.
Acid, Tannic B.P.—3s. per lb. Market quiet.
Acid, Tartaric.—1s. 1½d. to 1s. 2d. per lb., less 5%.
Amidol.—9s. per lb. d/d.
Acetanilide.—2s. 3d. per lb. for quantity. Demand slow. Prices shaded to secure large orders.
Amidopyrin.—13s. 3d. per lb. Neglected. Stocks low.
Ammonium Benzoate.—3s. 3d. to 3s. 6d. per lb. according to quantity.
Ammonium Carbonate B.P.—£37 per ton.
Atropine Sulphate.—12s. 6d. per oz. for English make.
Barbitone.—15s. per lb. Quiet market.
Benzonaphthol.—5s. 3d. per lb. Small inquiry.
Bismuth Salts.—A steady market. Prices according to quantity.
Bismuth Carbonate.—12s. 9d. to 14s. 9d. per lb.
Bismuth Citrate.—11s. 4d. to 13s. 4d. per lb.
Bismuth Salicylate.—10s. 2d. to 12s. 2d. per lb.
Bismuth Subnitrate.—10s. 9d. to 12s. 9d. per lb.
Borax B.P.—Crystal £29, Powder £30 per ton. Carriage paid any station in Great Britain.
Bromides.—Potassium, 10d. per lb.; sodium, 11d. per lb.; ammonium, 1s. per lb. Prices vary. Local stocks are being cleared and forward prices are higher. There are rumours of a coming shortage and higher prices in Germany.
Calcium Lactate.—Demand active. Good English make can be had from 1s. 7d. to 2s. 6d. per lb.
Chloral Hydrate.—4s. per lb. Very firm and scarce.
Chloroform.—2s. per lb. for cwt. lots. Very steady.
Creosote Carbonate.—6s. 6d. per lb. Little demand.
Formaldehyde.—£55 per ton, ex works. English make in casks. About 8s. per cwt. extra for carboys.
Glycerophosphates.—Fair business passing. Calcium, soluble and citrate free, 7s. per lb.; iron, 8s. 9d. per lb.; magnesium, 9s. per lb.; potassium, 50%, 3s. 6d. per lb.; sodium, 50%, 2s. 6d. per lb.
Guaiacol Carbonate.—10s. 6d. to 11s. 3d. per lb.
Hexamine.—3s. 6d. per lb. for English make. Market quiet and steady.
Homatropine Hydrobromide.—30s. per oz.
Hydrastine Hydrochloride.—English make offered at 120s. per oz.
Hydroquinone.—4s. 3d. per lb. in cwt. lots. Foreign make.
Hypophosphites.—Calcium, 3s. 6d. per lb. for 28 lb. lots; potassium, 4s. 1d. per lb.; sodium, 4s. per lb.
Iron Ammonium Citrate B.P.—2s. 1d. to 2s. 5d. per lb., according to quantity.
Magnesium Carbonate.—Light Commercial, £36 per ton net.
Magnesium Oxide.—Light Commercial, £75 per ton, less 2½%; Heavy Commercial, £26 per ton, less 2½%; Heavy Pure, 2s. to 2s. 2d. per lb., according to quantity. Steady market.
Menthol.—A.B.R. recrystallised B.P., 52s. 6d. per lb. Weaker. Synthetic, 26s. to 31s. per lb., according to quantity. English make. Strong demand.
Mercurials.—Market firm and more active. Red oxide, 5s. 3d. to 5s. 4d. per lb.; Corrosive sublimate, 3s. 6d. to 3s. 7d. per lb.; white precipitate, 4s. 7d. to 4s. 8d. per lb.; Calomel, 3s. 11d. to 4s. per lb.
Methyl Salicylate.—2s. 0d. to 2s. 3d. per lb. for carboys. Tendency still in buyers' favour.
Methyl Sulphonel.—26s. per lb.
Metol.—11s. per lb. British make.
Morphine and Salts.—Reduced by 1s. to 1s. 3d. per oz.
Paraformaldehyde.—3s. per lb. Ample supplies.
Paraldehyde.—1s. 6d. per lb. in free bottles and cases.
Phenacetin.—6s. to 6s. 3d. per lb. Price and demand steady.
Phenazone.—7s. 3d. to 7s. 6d. A shade firmer. Forward prices higher.
Phenolphthalein.—6s. 6d. per lb. Dealers appear anxious to sell.
Potassium Bitartrate 99/100% (Cream of Tartar).—88s. per cwt., less 2½% for ton lots. Firm market. Prices have upward tendency.
Potassium Citrate.—1s. 10d. to 2s. 2d. per lb. Dearer.
Potassium Iodide.—16s. 8d. to 17s. 5d. per lb., according to quantity. Demand continues heavy.
Potassium Metabisulphite.—7½d. per lb., 1-cwt. kegs included.
Potassium Permanganate.—B.P. crystals, 8¾d. to 9d. per lb., carriage paid; commercial, 8d. to 8¼d. per lb., carriage paid.
Quinine Sulphate.—2s. 3d. per oz., in 100 oz. tins. Very heavy demand.
Resorcin.—5s. 6d. to 5s. 9d. per lb. Firmer. Scarce.
Saccharin.—63s. per lb. in 50-lb. lots.
Salol.—3s. 6d. to 3s. 11d. per lb.
Silver Proteinate.—9s. 6d. per lb.
Sodium Benzoate, B.P.—2s. 9d. per lb. Ample supplies B.P. quality available.
Sodium Citrate, B.P.C., 1923.—1s. 11d. to 2s. 2d. per lb., according to quantity. Firmer in common with other citrates.
Sodium Hypophosphite, Photographic.—£13 to £15 per ton, according to quantity, d/d. consignee's station in 1-cwt. kegs.
Sodium Metabisulphite Crystals.—37s. 6d. to 60s. per cwt., net cash, according to quantity.
Sodium Nitroprusside.—16s. per lb. Less for quantity.
Sodium Potassium Tartrate (Rochelle Salt).—75s. to 82s. 6d. per cwt., according to quantity. Market steady, good demand.
Sodium Salicylate.—Powder, 2s. 2d. to 2s. 4d. per lb. Crystal, 2s. 4d. to 2s. 6d. per lb. Flake, 2s. 9d. lb. Market more active.
Sodium Sulphide, pure recrystallised.—10d. to 1s. 2d. per lb., according to quantity.
Sodium Sulphite, anhydrous, £27 10s. to £28 10s. per ton, according to quantity, 1 cwt. kegs included. In large casks £1 per ton less.
Thymol.—18s. per lb. Very scarce indeed, still rising. Forward quotations 22s. per lb.

Perfumery Chemicals

Acetophenone.—12s. 6d. per lb.
Aubepine.—15s. 3d. per lb. Advanced.
Amyl Acetate.—2s. 9d. per lb.
Amyl Butyrate.—6s. 9d. per lb.
Amyl Salicylate.—3s. 3d. per lb.
Anethol (M.P. 21/22° C.).—4s. 6d. per lb.
Benzyl Acetate from Chlorine-free Benzyl Alcohol.—2s. 10½d. per lb.
Benzyl Alcohol free from Chlorine.—2s. 10½d. per lb.
Benzaldehyde free from Chlorine.—3s. 6d. per lb.
Benzyl Benzoate.—3s. 6d. per lb.
Cinnamic Aldehyde Natural.—15s. 6d. per lb.
Coumarin.—20s. per lb.
Citronellol.—17s. per lb. Advanced.
Citral.—10s. per lb.
Ethyl Cinnamate.—13s. 6d. per lb. Cheaper.
Ethyl Phthalate.—3s. 3d. per lb.
Eugenol.—11s. per lb. Advanced.
Geraniol (Palmarosa).—35s. per lb.
Geraniol.—11s. to 18s. 6d. per lb.
Heliotropine.—7s. 9d. per lb. Advanced.
Iso Eugenol.—15s. 9d. per lb.
Linalol ex Bois de Rose.—26s. per lb.
Linalyl Acetate.—26s. per lb.
Methyl Anthranilate.—9s. 6d. per lb.
Methyl Benzoate.—6s. per lb.
Musk Ambrette.—45s. per lb. Cheaper.
Musk Xylol.—15s. per lb. Cheaper.
Nerolin.—4s. 9d. per lb. Advanced.
Phenyl Ethyl Acetate.—15s. per lb. Advanced.
Phenyl Ethyl Alcohol.—16s. per lb.
Rhodinol.—57s. 6d. per lb.
Safrol.—1s. 10d. per lb.
Terpineol.—2s. 4d. per lb. Cheaper.
Vanillin.—25s. 6d. per lb.

Essential Oils

Almond Oil, Foreign S.P.A.—15s. 6d. per lb.
Anise Oil.—2s. 8d. per lb.
Bergamot Oil.—19s. 6d. per lb.
Bourbon Geranium Oil.—36s. 6d. per lb.
Camphor Oil.—75s. per cwt.
Cananga Oil, Java.—10s. 6d. per lb.
Cinnamon Oil, Leaf.—6½d. per oz.
Cassia Oil, 80/85%.—8s. 9d. per lb. Cheaper.
Citronella Oil.—Java, 85/90%, 5s. 9d. per lb. Cheaper. Ceylon, 5s. 7½d. per lb.
Clove Oil.—7s. per lb.
Eucalyptus Oil, 70/75%.—2s. per lb.
Lavender Oil.—French 38/40% Esters, 29s. per lb.
Lemon Oil.—3s. per lb.
Lemongrass Oil.—3d. per oz.
Orange Oil, Sweet.—13s. 3d. per lb.
Otto of Rose Oil.—Bulgarian, 30s. per oz. Anatolian, 26s. per oz.
Palma Rosa Oil.—19s. per lb.
Peppermint Oil.—Wayne County, 20s. 9d. per lb. Japanese, 14s. 3d. per lb.
Petitgrain Oil.—9s. 6d. per lb.
Sandal Wood Oil.—Mysore, 26s. 6d. per lb. Australian, 21s. per lb

Scottish Chemical Market

The following notes on the Scottish Chemical Market are specially supplied to THE CHEMICAL AGE *by Messrs. Charles Tennant and Co., Ltd., Glasgow, and may be accepted as representing the firm's independent and impartial opinions.*

Glasgow, July 23, 1924.

THERE is little to report this week, very little business having been done, owing, no doubt, to the local holidays. Prices are on about the same level as last reported.

Industrial Chemicals

ACID ACETIC.—Glacial, 98/100%, £59 to £70 per ton; 80% pure, £47 to £49 per ton; 80% technical, £43 15s. to £45 per ton. All packed in casks delivered c.i.f. U.K. ports, duty free.

ACID BORACIC.—Crystal or granulated, £45 per ton; powdered, £47 per ton; carriage paid U.K. stations, minimum ton lots.

ACID CARBOLIC, ICE CRYSTALS.—Remains unchanged at about 6½d. per lb., carriage paid, or f.o.b. U.K. port.

ACID CITRIC, B.P. CRYSTALS.—Spot lots on offer at 1s. 6¼d. per lb., less 5 per cent. ex store. Offered for early delivery from the Continent at 1s. 5½d. per lb., less 5% ex wharf.

ACID FORMIC, 85%.—Unchanged at about £56 per ton ex store, spot delivery. Offered for early delivery at about £54 15s. per ton ex wharf.

ACID HYDROCHLORIC.—In little demand, price 6s. 6d. per carboy ex works.

ACID NITRIC.—80°, £23 10s. per ton ex station, full truck loads.

ACID OXALIC.—Price remains unchanged at 4¼d. per lb. ex store; very little inquiry.

ACID SULPHURIC.—144°, £3 12s. 6d. per ton; 168°, £7 per ton, ex works, full truck loads. Dearsenicated quality, 20s. per ton more.

ACID TARTARIC, B.P. CRYSTALS.—Spot material quoted 1s. 1¾d. per lb., less 5 per cent. ex store. Offered for early delivery at 1s. 1¼d. per lb., less 5 per cent. ex wharf.

ALUMINA SULPHATE.—17/18% iron free. Unchanged at £8 per ton ex store, spot delivery. Offered for prompt shipment from the Continent at £7 5s. per ton, c.i.f. U.K. port.

ALUM CHROME.—Ammonium chrome alum quoted £19 to £21 per ton according to quality f.o.b. U.K. port. Potash chrome alum on offer at £26 per ton ex store.

ALUM POTASH (LUMP).—Moderate inquiry for export. Quoted £9 5s. per ton f.o.b. U.K. port. Offered from the Continent at about £8 5s. per ton c.i.f. U.K. port.

AMMONIA ANHYDROUS.—Quoted 1s. 6d. per lb. ex station.

AMMONIA CARBONATE.—Lump, £37 per ton; powdered, £39 per ton; packed in 5 cwt. casks delivered U.K. port.

AMMONIA LIQUID 880°.—Unchanged at 2½d. to 3d. per lb. delivered, according to quantity, containers extra.

AMMONIA MURIATE.—Grey galvanisers quality unchanged at £30 per ton ex station. Fine white crystals quoted £25 5s. per ton c.i.f. U.K. port.

ARSENIC, WHITE POWDERED.—Practically no demand, spot lots nominally £51 per ton ex store.

BARIUM CARBONATE, 98/100%.—Quoted £11 5s. per ton c.i.f. U.K. port, prompt shipment.

BARIUM CHLORIDE, 98/100%.—English material unchanged at about £14 5s. per ton ex store. Continental on offer at £13 7s. 6d. per ton c.i.f. U.K. port.

BARYTES.—Finest English white quoted £5 5s. per ton ex works, continental about £5 per ton c.i.f. U.K. port.

BLEACHING POWDER.—Spot lots £11 per ton ex station. Contracts 20s. per ton less.

BORAX.—Granulated, £24 10s. per ton; crystals, £25 per ton; powdered, £26 per ton, carriage paid U.K. stations, minimum ton lots.

CALCIUM CHLORIDE.—English material unchanged at £5 12s. 6d. per ton ex station; continental prices advanced to £5 5s. per ton c.i.f. U.K. port.

COPPERAS, GREEN.—Quoted £3 per ton ex works, packed in casks.

COPPER SULPHATE.—Fairly good inquiry for export. Quoted £23 15s. per ton f.o.b. U.K. port. Continental material on offer at £24 per ton ex store.

FORMALDEHYDE, 40%.—Spot lots unchanged at about £54 per ton ex store. Offered for prompt shipment from America at £51 per ton c.i.f. U.K. port.

GLAUBER SALTS.—English material quoted £4 per ton ex store or station. Continental on offer at about £3 10s. per ton ex store.

LEAD, RED.—Imported material unchanged at £38 per ton ex store.

LEAD, WHITE.—Rather cheaper offers of imported material. Now quoted £41 per ton ex store, spot delivery.

LEAD, ACETATE.—White crystals offered from the Continent at about £43 15s. per ton c.i.f. U.K. port. Spot lots on offer at about £46 per ton ex store.

MAGNESITE, CALCINED.—English material quoted £8 per ton ex station, prompt delivery.

MAGNESIUM CHLORIDE.—Spot material unchanged at £3 17s. 6d. per ton ex store. Offered from the Continent at £3 7s. 6d. per ton c.i.f. U.K. port, minimum 50 ton lots. Smaller quantities 2s. 6d. per ton extra.

MAGNESIUM SULPHATE (EPSOM SALTS).—English material quoted £4 15s. per ton ex store, spot delivery. B.P. quality on offer at about £6 5s. per ton ex station.

POTASH CAUSTIC 88/92%.—Spot lots unchanged at about £29 10s. per ton ex store. Quoted £29 per ton c.i.f. U.K. port, prompt shipment from the Continent.

POTASSIUM BICHROMATE.—Quoted 5½d. per lb. delivered.

POTASSIUM CARBONATE 96/98%.—Spot lots unchanged at about £25 10s. per ton ex store. Offered from the Continent at £23 10s. per ton c.i.f. U.K. port.

POTASSIUM CHLORATE.—Unchanged at about 2¾d. per lb. ex store.

POTASSIUM NITRATE (SALTPETRE).—Quoted £29 per ton ex store, spot delivery. On offer from the continent at about £26 10s. per ton c.i.f. U.K. port.

POTASSIUM PERMANGANATE B.P. CRYSTALS.—Unchanged at 8½d. per lb. ex store, spot delivery. Commercial quality quoted 7½d. per lb. ex store.

POTASSIUM PRUSSIATE (YELLOW).—In little demand, and price unchanged at 7½d. per lb. f.o.b. U.K. port or ex station.

SODIUM CAUSTIC.—76/77%, £19 7s. 6d. per ton; 70/72%, £17 17s. 6d. per ton; 60/62% broken, £19 2s. 6d. per ton; 98/99%, powdered, £22 15s. per ton. All ex station spot delivery. Contracts, 20s. per ton less.

SODIUM ACETATE.—Spot lots on offer at £24 per ton, ex store. Quoted £22 7s. 6d. per ton c.i.f. U.K. port, prompt shipment from the Continent.

SODIUM BICARBONATE.—Refined recrystallised quality, £10 10s. per ton ex quay or station, M.W. quality 30s. per ton less.

SODIUM BICHROMATE.—English material unchanged at 4¼d. per lb. delivered.

SODIUM CARBONATE.—Soda crystals, £5 to £5 5s. per ton ex quay or station. Alkali, 58%, £8 12s. 3d. per ton ex quay or station.

SODIUM HYPOSULPHITE.—English material unchanged at £10 per ton ex station, continental offered at £9 15s. per ton ex store, spot delivery. Quoted £8 10s. per ton c.i.f. U.K. port, prompt shipment. Pea crystals of English manufacture quoted £13 15s. per ton ex station.

SODIUM NITRATE.—95/96% quality quoted £13 10s. per ton f.o.r. or f.o.b. U.K. port, 96/98%, 7s. 6d. per ton extra.

SODIUM NITRITE, 100%.—On offer at £26 10s. per ton ex store. 96/98% quality offered from the continent at £25 10s. per ton c.i.f. U.K. port.

SODIUM PRUSSIATE (YELLOW).—Unchanged at about 4¼d. per lb. ex station or f.o.b. U.K. port.

SODIUM SULPHATE (SALTCAKE).—Price for home consumption £3 10s. per ton carriage paid buyers' station. Good inquiry for export and price about £3 per ton f.o.b. U.K. port.

SODIUM SULPHIDE.—60/62% solid, of English manufacture, £14 15s. per ton ex station; broken, £1 per ton more; flake, £2 per ton more; 60/62% solid, offered from the continent at £12 5s. per ton c.i.f. U.K. port; broken, £1 per ton more; 31/34% crystals of English manufacture, £9 2s. 6d. per ton ex station; 30/32% crystals of continental manufacture, quoted £8 10s. per ton c.i.f. U.K.

SULPHUR.—Flowers, £10 per ton; roll, £9 per ton; rock, £9 per ton; ground, £8 per ton; prices nominal.

ZINC CHLORIDE.—96/98%.—English makers' price unchanged at about £27 5s. per ton f.o.b. U.K. port; 98/100% quality offered from the continent at £24 10s. per ton c.i.f. U.K. port.

ZINC SULPHATE.—English material unchanged at £13 10s. per ton, ex station. On offer from the continent at £11 per ton c.i.f. U.K. port.

NOTE.—The above prices are for bulk business and are not to be taken as applicable to small parcels.

Coal Tar Intermediates and Wood Distillation Products

ALPHA NAPHTHOL.—Small export inquiry. Price 2s. 6d. per lb. f.o.b.

ALPHA NAPHTHYLAMINE.—Some home inquiry. Price 1s. 4½d. per lb. delivered.

BENZALDEHYDE.—Several small home inquiries. Price 2s. 4d. lb. delivered, returnable packages.

DICHLORANILINE.—Some home inquiry. Price 2s. 2d. per lb. delivered.

"H" ACID.—Export inquiry. Price 4s. lb. 100% basis.

META TOLUYLENE DIAMINE.—Small export inquiry. Price 4s. 3d. per lb. f.o.b.

META PHENYLENE DIAMINE.—Small export inquiry. Price 4s. lb. f.o.b.

META XYLIDINE ACETATE.—Limited home demand. Price 4s. lb. delivered.

PARANITRANILINE.—Good home inquiry. Price 2s. 3½d. lb. delivered.

PARA DICHLORBENZOL.—Some inquiries both home and export. Price £72 per ton delivered or f.o.b.

RESORCIN.—Some home demand. Price 4s. 6d. lb. delivered.

The Manchester Chemical Market

[FROM OUR OWN CORRESPONDENT.]

Manchester, July 24, 1924.

FOR the most part, prices of chemical products on the Manchester market during the past week have been steady, but there are still instances of continued weakness to be reported. Generally speaking, the home demand is on quietly steady lines, although, as before, largely confined to spot or near delivery transactions. Forward business continues to be on a very modest scale. A fair volume of inquiry for export is reported, chiefly on Colonial account, but actual business is far from brisk.

Heavy Chemicals

Sulphide of sodium is still quoted at round £14 10s. per ton for 60–65 per cent. concentrated solid, and £9 10s. for crystals, though the amount of business being put through shows little or no improvement over recent weeks. Sales of prussiate of soda are also restricted and values are again easy, 4d. to 4¼d. per lb. now being quoted. Saltcake continues quiet but unchanged from last week at £3 10s. per ton to home users and £3 5s. for shipment. Chlorate of soda is steadier and in moderate request at 2½d. to 2¾d. per lb. Both home and foreign demand for caustic soda continues fairly good, values range from £16 17s. 6d. per ton for 60 per cent. material to £19 7s. 6d. for 76–77 per cent. Bleaching powder is steady at £10 per ton, with the demand still slow. Acetate of soda is steady and in moderate request at £23 to £23 10s. per ton. Hyposulphite of soda has been a shade more active at £14 5s. to £14 10s. per ton for photographic crystals and £9 5s. to £9 10s. for commercial. Alkali is steady at £6 15s. per ton, a fair amount of home and export business being put through. Glauber salts are inactive, but about unchanged from last report at about £3 10s. per ton. Phosphate of soda is rather quiet at £13 10s. to £14 per ton. Soda crystals are steady and meet with a quiet demand at £5 5s. per ton. Bicarbonate of soda is still quoted at round £10 10s. per ton. Bichromate of soda is in small request, with values unchanged at the recently reduced price of 4¼d. per lb.

Caustic potash continues in reduced demand and prices are easy, current values ranging round £29 per ton for 90 per cent. strength. Carbonate of potash is also less active, although at £22 10s. per ton values show little change from last report. Yellow prussiate of potash is now offering at 7¼d. to 7½d. per lb., but buying interest is still restricted. Bichromate of potash is in moderate demand, with prices steady at 5½d. per lb. Chlorate of potash is rather quiet, but unchanged at 2¾d. per lb. Permanganate of potash is attracting only a limited amount of attention and values have an easy tendency, ranging from 6¾d. to 7¼d. per lb.

Arsenic values continue weak, current quotation here being no higher than £46 per ton for white powdered, Cornish makes; export demand for this commodity is still very slow. Sulphate of copper shows little increased activity although values are about the same as last week at £24 5s. to £24 10s. per ton f.o.b. Sales of acetate of lime are rather slow; grey material is on offer at about £18 per ton, brown being a shade easier at £12 10s. per ton. Commercial Epsom salts keep steady and moderately active at £4 15s. to £5 per ton, with magnesium sulphate, B.P., quoted at about £6 10s. Acetate of lead is quiet at £46 to £47 per ton for white and round, £45 for brown. Nitrate of lead is fairly steady at £42 to £43 per ton.

Acids and Tar Products

An easier tendency is to be observed in the acids. Tartaric acid is now on offer at round 1s. 1d. per lb., demand being slower. Citric acid is quoted at about 1s. 5½d. per lb. Oxalic acid remains dull and weaker at 4¼d. per lb. Acetic acid is in moderate request at £46 per ton for 80 per cent. commercial and about £70 for glacial.

The coal-tar products continue in small demand. Pitch is rather steadier at about £3 per ton, Manchester, although inquiry is still slow. Crystal carbolic is quoted at 6½d. to 6¾d. per lb., and crude at round 2s. per gallon. Naphthalenes are quiet but about unchanged at £16 to £17 per ton for refined qualities, and £5 and upwards for crude. Solvent naphtha is dull and easy at 1s. 3½d. to 1s. 4d. per gallon. Cresylic acid is fairly steady at 2s. to 2s. 2d. Cresote oil is only in moderate request at about 6½d. per gallon.

Monthly List of Current Prices

The following prices are supplied to THE CHEMICAL AGE ***by Messrs. R. W. Greeff & Co., Ltd., and Messrs. Chas. Page & Co., Ltd. These prices, which are given mainly as a guide to works managers, chemists and chemical engineers, apply to fair quantities delivered ex wharf or works, except where otherwise stated***

General Chemicals

	Per	£	s.	d.		£	s.	d.
Acetic anhydride, 90–95%	lb.	0	1	8	to	0	1	10
Acetone oil	ton	55	0	0	to	65	0	0
Acetone, pure	ton	102	0	0	to	105	0	0
Acid, Acetic, glacial, 99–100%	ton	69	0	0	to	71	0	0
Acetic, 80% pure	ton	43	0	0	to	44	0	0
Acetic, 40% pure	ton	24	0	0	to	24	10	0
Arsenic, liquid, 2000 s.g.	ton	85	0	0	to	88	0	0
Boric, commercial	ton	45	0	0	to	48	0	0
Carbolic, cryst. 39–40%	lb.	0	0	7	to	0	0	7½
Citric	lb.	0	1	5½	to	0	1	6
Formic, 85%	ton	55	10	0	to	56	10	0
Hydrofluoric	lb.	0	0	7	to	0	0	8
Lactic, 50 vol.	ton	37	0	0	to	39	0	0
Lactic, 60 vol.	ton	43	0	0	to	45	0	0
Nitric, 80 Tw.	ton	23	0	0	to	25	0	0
Oxalic	lb.	0	0	4¼	to	0	0	4½
Phosphoric, 1.5	ton	35	0	0	to	38	0	0
Pyrogallic, cryst.	lb.	0	7	6	to	0	8	0
Salicylic, technical	lb.	0	1	9½	to	0	2	0
Sulphuric, 92–93%	ton	5	0	0	to	6	0	0
Tannic, commercial	lb.	0	1	9	to	0	2	0
Tartaric	lb.	0	1	1	to	0	1	1½
Alum, lump	ton	11	10	0	to	12	0	0
Chrome	ton	23	0	0	to	24	0	0
Alumino ferric	ton	7	0	0	to	7	5	0
Aluminium, sulphate, 14–15%	ton	7	0	0	to	7	15	0
Sulphate, 17–18%	ton	8	0	0	to	8	10	0
Ammonia, anhydrous	lb.	0	1	6	to	0	1	8
.880	ton	32	0	0	to	34	0	0
.920	ton	22	0	0	to	24	0	0
Carbonate	ton	37	0	0	to	39	0	0
Chloride	ton	50	0	0	to	55	0	0
Muriate (galvanisers)	ton	32	0	0	to	33	0	0
Nitrate (pure)	ton	40	0	0	to	45	0	0
Phosphate	ton	63	0	0	to	65	0	0
Sulphocyanide, commercial 90%	lb.	0	1	5	to	0	1	6
Amyl acetate, technical	ton	178	0	0	to	180	0	0
Arsenic, white powdered	ton	45	0	0	to	48	0	0
Barium, carbonate, Witherite	ton	5	0	0	to	6	0	0
Carbonate, Precip.	ton	15	0	0	to	16	0	0
Chlorate	ton	61	0	0	to	63	0	0
Chloride	ton	13	0	0	to	14	0	0
Nitrate	ton	37	0	0	to	40	0	0
Sulphate, blanc fixe, dry	ton	20	10	0	to	21	0	0
Sulphate, blanc fixe, pulp	ton	10	5	0	to	10	10	0
Sulphocyanide, 95%	lb.	0	0	11	to	0	1	0
Bleaching powder, 35–37%	ton	10	0	0	to	10	10	0
Borax crystals, commercial	ton	25	0	0	to	—		
Calcium acetate, Brown	ton	13	0	0	to	14	0	0
Grey	ton	17	0	0	to	17	10	0
Carbide	ton	13	0	0	to	13	10	0
Chloride	ton	5	15	0	to	6	0	0
Carbon bisulphide	ton	28	0	0	to	30	0	0
Casein technical	ton	55	0	0	to	57	10	0
Cerium oxalate	lb.	0	3	0	to	0	3	6
Chromium acetate	lb.	0	1	1	to	0	1	3
Cobalt acetate	lb.	0	5	0	to	0	5	6
Oxide, black	lb.	0	8	6	to	0	9	0
Copper chloride	lb.	0	1	1	to	0	1	2
Sulphate	ton	24	0	0	to	24	10	0
Cream tartar, 98–100%	ton	83	0	0	to	84	0	0
Epsom salts (*see* Magnesium sulphate)								
Formaldehyde, 40% vol.	ton	54	0	0	to	—		
Formusol (Rongalite)	lb.	0	1	11	to	0	2	0
Glauber salts commercial	ton	3	10	0	to	4	0	0

	Per	£	s.	d.		£	s.	d.
Glycerin crude	ton	65	0	0	to	67	10	0
Hydrogen peroxide, 12 vols.	gal.	0	1	10	to	2	0	0
Iron perchloride	ton	20	0	0	to	22	0	0
Sulphate (Copperas)	ton	3	10	0	to	4	0	0
Lead acetate, white	ton	47	0	0	to	48	0	0
Carbonate (White Lead)	ton	45	0	0	to	50	0	0
Nitrate	ton	44	0	0	to	44	10	0
Litharge	ton	42	0	0	to	45	0	0
Lithophone, 30%	ton	22	10	0	to	23	0	0
Magnesium chloride	ton	4	0	0	to	4	5	0
Carbonate, light	cwt.	2	10	0	to	2	15	0
Sulphate (Epsom salts commercial)	ton	5	5	0	to	5	15	0
Sulphate (Druggists')	ton	8	0	0	to	9	0	0
Manganese Borate, commercial	ton	65	0	0	to	75	0	0
Sulphate	ton	45	0	0	to	48	0	0
Methyl acetone	ton	70	0	0	to	72	0	0
Alcohol, 1% acetone	ton	70	0	0	to	72	0	0
Nickel sulphate, single salt	ton	45	0	0	to	48	0	0
Ammonium sulphate double salt	ton	45	0	0	to	48	0	0
Potash, Caustic	ton	32	0	0	to	33	0	0
Potassium bichromate	lb.	0	0	5½	to		—	
Carbonate, 90%	ton	24	0	0	to	26	0	0
Chloride, 80%	ton	8	0	0	to	9	0	0
Chlorate	lb.	0	0	3¼	to		—	
Metabisulphite, 50–52%	ton	63	0	0	to	65	0	0
Nitrate, refined	ton	38	0	0	to	40	0	0
Permanganate	lb.	0	0	7½	to	0	0	7¾
Prussiate, red	lb.	0	1	9	to	0	2	0
Prussiate, yellow	lb.	0	0	8	to	0	0	8¼
Sulphate, 90%	ton	10	0	0	to	10	10	0
Salammoniac, firsts	cwt.	2	5	0	to		—	
Seconds	cwt.	2	7	6	to		—	
Sodium acetate	ton	23	15	0	to	24	0	0
Arsenate, 45%	ton	43	0	0	to	45	0	0
Bicarbonate	ton	10	10	0	to	11	0	0
Bichromate	lb.	0	0	4¾	to		—	
Bisulphite, 60–62%	ton	19	0	0	to	20	0	0
Chlorate	lb.	0	0	2¾	to	0	0	3
Caustic, 70%	ton	17	10	0	to	18	0	0
Caustic, 76%	ton	18	10	0	to	19	0	0
Hydrosulphite, powder	lb.	0	1	6	to	0	1	7
Hyposulphite, commercial	ton	10	0	0	to	10	10	0
Nitrite, 96–98%	ton	26	10	0	to	27	0	0
Phosphate, crystal	ton	14	0	0	to	14	10	0
Perborate	lb.	0	0	11	to	0	1	0
Prussiate	lb.	0	0	4¾	to	0	0	4½
Sulphide, crystals	ton	8	10	0	to	9	0	0
Sulphide, solid, 60–62%	ton	15	0	0	to	16	10	0
Sulphite, cryst.	ton	11	10	0	to	12	0	0
Strontium carbonate	ton	50	0	0	to	55	0	0
Nitrate	ton	50	0	0	to	55	0	0
Sulphate, white	ton	6	10	0	to	7	10	0
Sulphur chloride	ton	25	0	0	to	27	10	0
Flowers	ton	9	0	0	to	9	10	0
Roll	ton	8	10	0	to	9	0	0
Tartar emetic	lb.	0	0	11	to	0	1	0
Tin perchloride, 33%	lb.	0	1	5	to	0	1	6
Perchloride, solid	lb.	0	1	6	to	0	1	7
Protochloride (tin crystals)	lb.	0	1	6	to	0	1	7
Zinc chloride 102° Tw.	ton	19	0	0	to	20	0	0
Chloride, solid, 96–98%	ton	25	0	0	to	30	0	0
Oxide, 99%	ton	42	0	0	to	45	0	0
Dust, 90%	ton	50	0	0	to	55	0	0
Sulphate	ton	13	10	0	to	13	15	0

Pharmaceutical Chemicals

Acetyl salicylic acid	lb.	0	3	4	to	0	3	6
Acetanilid	lb.	0	2	4	to	0	2	6
Acid, Gallic, pure	lb.	0	3	0	to	0	3	3
Lactic, 1.21	lb.	0	2	9	to	0	3	0
Salicylic, B.P.	lb.	0	1	9	to	0	1	10
Tannic, leviss	lb.	0	3	0	to	0	3	3
Amidol	lb.	0	8	6	to	0	9	0
Amidopyrin	lb.	0	13	6	to	0	14	0
Ammon ichthosulphonate	lb.	0	1	10	to	0	2	0
Barbitone	lb.	0	15	6	to	0	16	0
Beta naphthol resublimed	lb.	0	3	6	to	0	4	0
Bromide of ammonia	lb.	0	1	0	to	0	1	2
Potash	lb.	0	0	10	to	0	0	11
Soda	lb.	0	0	10½	to	0	0	11½
Caffeine, pure	lb.	0	12	0	to	0	12	6
Calcium glycerophosphate	lb.	0	5	9	to	0	6	0
Lactate	lb.	0	1	6	to	0	1	9
Calomel	lb.	0	3	9	to	0	4	0
Chloral hydrate	lb.	0	4	1	to	0	4	3
Cocaine alkaloid	oz.	1	0	0	to	1	2	6
Hydrochloride	oz.	0	17	0	to	0	17	6
Corrosive sublimate	lb.	0	3	3	to	0	3	6
Eucalyptus oil, B.P. (70–75% eucalyptol)	lb.	0	2	0	to	0	2	2
B.P. (75–80% eucalyptol)	lb.	0	2	1	to	0	2	3
Guaiacol carbonate	lb.	0	11	9	to	0	12	0
Liquid	lb.	0	10	6	to	0	11	0
Pure crystals	lb.	0	11	0	to	0	11	6
Hexamine	lb.	0	3	9	to	0	4	0
Hydroquinone	lb.	0	4	6	to	0	5	0
Lanoline anhydrous	lb.	0	0	8	to	0	0	9
Lecithin ex ovo	lb.	1	5	0	to	1	7	6
Lithi carbonate	lb.	0	9	9	to	0	10	3
Methyl salicylate	lb.	0	2	6	to	0	2	9
Metol	lb.	0	11	6	to	0	13	6
Milk sugar	cwt.	3	17	6	to	4	5	0
Paraldehyde	lb.	0	1	5	to	0	1	7
Phenacetin	lb.	0	6	0	to	0	6	6
Phenazone	lb.	0	7	6	to	0	8	0
Phenolphthalein	lb.	0	6	3	to	0	6	6
Potassium sulpho guaiacolate	lb.	0	6	3	to	0	6	9
Quinine sulphate, B.P.	oz.	0	2	3	to		—	
Resorcin, medicinal	lb.	0	5	9	to	0	6	0
Salicylate of soda powder	lb.	0	2	4	to	0	2	6
Crystals	lb.	0	2	6	to	0	2	9
Salol	lb.	0	4	0	to	0	4	3
Soda Benzoate	lb.	0	2	9	to	0	3	0
Sulphonal	lb.	0	16	0	to	0	16	6
Terpene hydrate	lb.	0	1	9	to	0	2	0
Theobromine, pure	lb.	0	12	0	to	0	12	3
Soda salicylate	lb.	0	8	6	to	0	9	0
Vanillin	lb.	1	5	6	to	1	8	0

Coal Tar Intermediates, &c.

Alphanaphthol, crude	lb.	0	1	9	to	0	2	0
Refined	lb.	0	2	3	to	0	2	6
Alphanaphthylamine	lb.	0	1	6½	to	0	1	7
Aniline oil, drums extra	lb.	0	0	8½	to	0	0	8¾
Salts	lb.	0	0	9	to	0	0	9¼
Anthracene, 40–50%	unit	0	0	8½	to	0	0	9
Benzaldehyde (free of chlorine)	lb.	0	2	9	to	0	3	0
Benzidine, base	lb.	0	4	4	to	0	4	7
Sulphate	lb.	0	3	4	to	0	3	7
Benzoic acid	lb.	0	2	0	to	0	2	3
Benzyl chloride, technical	lb.	0	2	0	to	0	2	3
Betanaphthol	lb.	0	1	1	to	0	1	2
Betanaphthylamine, technical	lb.	0	4	0	to	0	4	3
Croceine Acid, 100% basis	lb.	0	3	3	to	0	3	6
Dichlorbenzol	lb.	0	0	9	to	0	0	10
Diethylaniline	lb.	0	4	6	to	0	4	9
Dinitrobenzol	lb.	0	1	1	to	0	1	2
Dinitrochlorbenzol	lb.	0	0	10	to	0	0	11
Dinitronaphthalene	lb.	0	1	4	to	0	1	5
Dinitrotoluol	lb.	0	1	3	to	0	1	4
Dinitrophenol	lb.	0	1	6	to	0	1	7
Dimethylaniline	lb.	0	2	8	to	0	2	10
Diphenylamine	lb.	0	3	0	to	0	3	3
H-Acid	lb.	0	4	3	to	0	4	6
Metaphenylenediamine	lb.	0	4	0	to	0	4	3
Monochlorbenzol	lb.	0	0	10	to	0	1	0
Metanilic Acid	lb.	0	5	9	to	0	6	0
Metatoluylenediamine	lb.	0	4	0	to	0	4	3
Monosulphonic Acid (2.7)	lb.	0	8	6	to	0	9	6
Naphthionic acid, crude	lb.	0	2	4	to	0	2	6
Naphthionate of Soda	lb.	0	2	4	to	0	2	6
Naphthylamine-di-sulphonic-acid	lb.	0	4	0	to	0	4	3
Neville Winther Acid	lb.	0	7	3	to	0	7	9
Nitrobenzol	lb.	0	0	7	to	0	0	8
Nitronaphthalene	lb.	0	0	11½	to	0	1	0
Nitrotoluol	lb.	0	0	8	to	0	0	9
Orthoamidophenol base	lb.	0	12	0	to	0	12	6
Orthodichlorbenzol	lb.	0	1	0	to	0	1	1
Orthotoluidine	lb.	0	0	10	to	0	0	11
Orthonitrotoluol	lb.	0	0	3	to	0	0	4
Para-amidophenol base	lb.	0	8	6	to	0	9	0
Hydrochlor	lb.	0	7	6	to	0	8	0
Paradichlorbenzol	lb.	0	0	9	to	0	0	10
Paranitraniline	lb.	0	2	6	to	0	2	8
Paranitrophenol	lb.	0	2	3	to	0	2	6
Paranitrotoluol	lb.	0	2	9	to	0	3	0
Paraphenylenediamine, distilled	lb.	0	12	0	to	0	12	6
Paratoluidine	lb.	0	5	6	to	0	5	9
Phthalic anhydride	lb.	0	2	6	to	0	2	9
Resorcin, technical	lb.	0	4	0	to	0	4	3
Sulphanilic acid, crude	lb.	0	0	9	to	0	0	10
Tolidine, base	lb.	0	7	3	to	0	7	9
Mixture	lb.	0	2	6	to	0	2	9

Company News

JOSEPH NATHAN AND CO.—Sir Charles Davidson has joined the board.

CONSETT SPANISH ORE CO.—The directors recommend a dividend of 1s. per share on the ordinary shares.

THE INTERNATIONAL NICKEL CO.—A quarterly dividend of 1½ per cent. on the preferred stock has been declared, payable on August 1.

UNITED ALKALI CO., LTD.—The directors announce an interim dividend of 5 per cent., less tax, against 4 per cent., less tax, a year ago.

KYNOCH, LTD.—A dividend of 31 per cent., free of tax, is announced on the ordinary shares for the year 1923, against 66⅔ per cent. for the previous year.

ENGLISH CHINA CLAYS, LTD.—A dividend on the preference shares at the rate of 7 per cent. per annum for the half year ended June 30, is announced, payable on August 1.

C. AND W. WALKER.—An interim dividend at the rate of 10 per cent. per annum, free of tax, is announced on the ordinary shares for the half year, payable on August 1.

W. AND H. M. GOULDING (LIMITED).—A dividend of 5 per cent. on the ordinary shares for the year ended June 30 is announced, payable in equal portions on July 31 and December 31.

KEELEY SILVER MINES, LTD.—The directors have declared a dividend of 8 per cent., with a bonus of 4 per cent., on account of the year ending February, 1925, payable on September 15.

SQUIRE AND CO., BIRMINGHAM, LTD.—At the annual meeting, held on July 16, it was decided that out of the available balance of £12,995, a dividend of 12½ per cent. be paid on the ordinary shares, and also on the deferred ordinary shares, leaving a balance of £5,245 to be carried forward.

COURTAULDS, LTD.—At an extraordinary general meeting held on July 17, resolutions to increase the capital of the company to £20,000,000 by the creation and issue to the shareholders of 8,000,000 5 per cent. cumulative preference shares of £1 each, were considered and unanimously adopted.

VAN DEN BERGHS.—The net profits for the year 1923 amounted to £358,757 against £346,842 in 1922, and £108,327 was brought forward, making a total of £467,084. It is proposed to pay a final dividend on the ordinary shares of 1s. 6d. per share, making 2s. 6d. per share for the year, leaving a balance of £114,624 to be carried forward.

WELSBACH LIGHT CO., LTD.—Mr. J. R. Yates, in dealing with the accounts at the annual meeting on July 17, remarked that the financial position of the company was better than it had been for either of the two previous years, although during that time they had paid in dividends over £32,000 and had reduced their debenture liability by £14,000. The long view taken by the board had led them to adopt the policy of broadening and extending the interests and activities of the company so that, should fortune no longer favour the gas mantle industry, they should not be wholly dependent on that particular form of business. In this they had so well succeeded that during the last six years the proportion of their turnover in what might be called "sundries"—*i.e.*, goods other than mantles—to the total turnover had gradually risen by upwards of 30 per cent. expressed in pounds sterling. This increase was still continuing in the current year. The report and accounts were unanimously adopted and a dividend of 5 per cent., less income tax, was declared.

Industrial Alcohol

AT the annual meeting of the Distillers Co., Ltd., on Tuesday, in announcing the same rate of dividend as last year, the chairman said that their activities in connection with the production of alcoholic motor fuel, "Discol" had been hampered by the high cost of the raw material, molasses, and efforts had been made to find an alternative. They had reason to hope that they had at last found a substitute made possible by the application of two Continental processes which have been amalgamated and formed into one company under the name of the International Sugar and Alcohol Co., Ltd., in which the Distillers Co., Ltd., had the controlling interest.

New Chemical Trade Mark

Applications for Registration

Opposition to the Registration of the following Trade Mark can be lodged up to August 23, 1924. Further information may be obtained from Mr. H. T. P. Gee, Patent and Trade Mark Agent, 51 and 52, Chancery Lane, W.C.2.

"KOSMOS."

443,903. For carbon black included in Class 1. Cosmos Carbon Company (a Corporation organised under the laws of the State of West Virginia, United States of America), Union Trust Building, Charleston, West Virginia, United States of America, manufacturers. December 22, 1923.

Tariff Changes

BRITISH INDIA.—A Government Notification dated June 9, 1924, exempts sulphur imported into British India from the payment of Customs duty.

FRENCH WEST AFRICA.—A decree, dated June 5, lays down the "coefficient of increase" to be applied during the second half of 1924 to import and export duties in French West Africa. The "coefficients" are the same as those applied during the first half of the year, except that the import "coefficient" applied to the duties on alcohol and potable spirits, distilled beverages, aromatical spirits (*alcoolats*), and other alcohol, ordinary wines with more than 15 degrees of alcohol, and alcoholic perfumery has been raised from 1.5 to 2.

FORMOSA (JAPAN).—The duty-free importation into Formosa of wooden casks and iron drums used as receptacles for alcohol and of wooden casks used as receptacles for molasses is now permitted.

POLAND.—The exportation of crude petroleum has been prohibited. The export of mineral superphosphates is now permitted.

JAPAN.—Vegetable oils, fats, soaps, aromatic chemicals, general chemicals, drugs and medicines are said to be affected by the proposed Customs duties increase.

Chemical Trade Inquiries

The following inquiries, abstracted from the "Board of Trade Journal," have been received at the Department of Overseas Trade (Development and Intelligence), 35, Old Queen Street, London, S.W.1. British firms may obtain the names and addresses of the inquirers by applying to the Department (quoting the reference number and country), except where otherwise stated.

OILS, FATS, GREASES.—An agent, established at Nantes, is desirous of obtaining the representation of British firms for the sale in France of oils, fats, greases. (Reference No. 121.)

PAINTS, OILS.—Grimsby Corporation invite tenders for a supply of paints and oils for six months from October 1. Mr. H. G. Whyatt, borough engineer, 170, Victoria Street, Grimsby.

CHEMICAL MANURES AND COLOURS.—A British commission agent, with headquarters in Barcelona, and travelling throughout the country, is desirous of securing British agencies for the sale of oil seeds, chemical manures, and colours. (Reference No. 130.)

Alleged Fertiliser Factory Nuisance

AT West Bromwich, on Monday, Norman Tailby, trading as the Stonehouse Works Co., Paradise Street, West Bromwich, answered a summons in which he was alleged to be responsible for a public nuisance arising from smells. Complaints had been received by the Corporation from people living in the neighbourhood of the works. In 1922 the defendant asked for a licence to manufacture fertilisers, the de-greasing and crushing of bones, and the drying of hoofs and horns. The Council gave its consent on condition that the trade was carried on in such a way that it was not obnoxious or offensive, and that no nuisance was created. The sanitary inspectors visited the premises on 64 occasions, and on only two was there anything to complain of, but the inhabitants still complained. The case was adjourned *sine die*.

Commercial Intelligence

The following are taken from printed reports, but we cannot be responsible for any errors that may occur.

Bill of Sale

HAWKSWORTH, ARTHUR, 44, Buttermere Road, Sheffield, chemical warehouseman. (B.S., 26/7/24.) £49. July 21.

Deed of Arrangement

WARNER, Alfred John, and REEVES, Peter, trading at 12, Edmund Place, Aldersgate Street, E.C., as W. SUTER AND CO., chemical and glass merchants. (D.A., 26/7/24.) Filed July 18. Trustee, W. H. King, 13 and 14, Basinghall Street, E.C., C.A. Liabilities unsecured, £1,348; assets, less secured claims, £575.

London Gazette, &c.

Reduction of Capital

ANGLO-SPANISH TARTAR REFINERIES, LTD. (R.C., 26/7/24.) A petition has been presented to the Court for confirming the reduction of the capital of the company from £150,000 to £3,968, and is to be heard before Mr. Justice Romer on July 25.

Company Winding Up

C.V.O. CHEMICAL WORKS (1919) LTD., 29, Friar Lane, Leicester. (C.W.U., 26/7/24.) Winding up order, July 15.

Companies Winding Up Voluntarily

BRITISH PATENT SURBRITE CO., LTD. (C.W.U.V., 26/7/24.) Percy Ford, 93, Deacon Road, Cricklewood, N.W., appointed liquidator. Meeting of creditors at 6, Alfred Place, Tottenham Court Road, London, W.C.1, on Friday, August 1, at 12 noon.

MASTER PAINTERS' PAINT MANUFACTORY, LTD (C.W.U.V., 6/7/24.) Meeting of creditors, July 31, at 3 p.m Ernest T. Kemp appointed liquidator.

PURE LIME SPAR PRODUCTS, LTD. (C.W.U.V., 26/7/24.) Millen P. Killey, 41–43, Castle Street, Liverpool, appointed liquidator. Meeting of creditors at the liquidator's office on Friday, August 1, at 12 noon. Particulars of claims to the liquidator by August 21.

U.K. PETROLEUM SYNDICATE, LTD.—(C.W.U.V., 26/7/24,) Edwin J. Fyfe, solicitor, appointed liquidator. Meeting of creditors at 46, Charlotte Square, Edinburgh, on Tuesday, July 29, at 10 a.m.

Receivership

CHEMICAL AND TECHNICAL ENGINEERING CO., LTD. (R., 26/7/24.) H. R. Gothard, of 8, Laurence Pountney Hill, E.C., was appointed receiver and manager on July 2, 1924, under powers contained in debentures authorised December 19, 1923.

New Companies Registered

ALFRED BISHOP, LTD., 48, Spelman Street, London, E.1. Manufacturing chemists and druggists, oil and colourmen, etc. Nominal capital, £75,000 in £1 shares.

BISHOPSGATE-VULCAN, LTD., Vulcan Works, Cooks Road, Stratford, London, E.15. Manufacturers of varnish and enamels. Nominal capital, £2,000 in £1 shares.

LAURISTON CO., LTD., 34, Lauriston Road, Hackney, London, E.9. Manufacturers and/or merchants of cleansers and scouring materials, soaps, disinfectants, etc. Nominal capital, £250 in £1 shares.

MOND TAR BY-PRODUCTS SYNDICATE, LTD., 47, Victoria Street, Westminster, London. Manufacturers of and dealers in chemical substances and compounds of all kinds. Nominal capital, £25,000 in £1 shares.

PEACHEY TEXTILES, 83, Pall Mall, London, S.W.1. To adopt an agreement with the Peachey Process Co., Ltd., for the grant of a licence in respect of a process for the vulcanisation of caoutchouc, etc. Nominal capital £30,000 in £1 shares. Directors: Sir Robert W. Gillan, C. S. Baring-Gould, and Professor A. G. Green.

Brunner Mond and Magadi Soda

THE proposals of Brunner, Mond and Co., Ltd., under which they will undertake to provide cash and work the Magadi Soda Co.'s property to its full economic capacity are now well advanced. A new company is to be formed, with a capital of £830,000, and Brunner, Mond and Co. will take up all the ordinary shares—100,000 of £1 each—at par. They will also acquire any preferred ordinary shares not taken up by the holders of the present second preference and indemnify the Official Receiver against certain possible claims, and a minimum output will be agreed upon. The present proposals are to exchange holdings and interests into the new company as under:—For first debentures an equal amount, but interest arrears to be cancelled; for second debentures and unsecured creditors, 75 per cent. in 6 per cent. first preference shares, but unpaid interest to be cancelled; for ordinary shares (£1,250,050), an equal number of 6 per cent. second preference with right to subscribe for a proportion of the preferred ordinary; for every 20 shilling deferred share (total £62,500) one second preference of 5s. each, with same subscription right as holders of ordinary will have.

The capital will be divided into 250,000 preference shares of £1, 1,320,000 second preference of 5s., 600,000 12½ per cent. non-cumulative preferred ordinary of 5s., and, as stated already, 100,000 ordinary of £1 each. For the first two years debenture interest and preference dividends will only be payable out of profits, but after that they will be cumulative. Brunner, Mond and Co. will, of course, hold the controlling interest.

Compensation for Manganese Poisoning

AT Stroud County Court, George Henry Cecil Smith, of Uplands Road, Stroud, claimed compensation from S. G. Bailey and Co., Ltd., paint and varnish manufacturers, of Stafford Mills, Stroud, in respect of incapacity alleged to have arisen from manganese poisoning sustained in the course of his employment. It was said that probably this was the first case of its kind ever brought in any County Court. Manganese poisoning was not scheduled as an industrial disease until January 16 of this year, and was not enforced until February 1.

Applicant said he was employed as a manganese grinder from February, 1922, to October, 1923. The manganese ore was ground by heavy rollers, and it was then sent through a sieve, turning it into a very fine powder. The workers became black as ink in about five minutes. He was treated on two occasions at Bristol Royal Infirmary for manganese poisoning, and at one examination there were 150 doctors present from all parts of the country. He could not do any work, and had very little use of his arms and legs. The applicant had been medically certified as suffering from manganese poisoning. Judgment was given for applicant, the compensation to be 30s. per week as from April 17. Stay of execution was agrnted on condition that £10 of the amount due was paid.

A New Synthetic Cocaine

UNDER the name Psicain, an acid tartrate of d-ψ-cocaine has been put on the market by E. Merck's Chemical Works Darmstadt. This product is made synthetically, and isreally, a result of the researches originated by Wilstätter, and continued by his former pupils, Dr. O. Wolfes and Dr. H. Mäder. There are twelve possible isomerides, most of which have been prepared, but the properties of dextro-ψ-cocaine most nearly approach those of the natural product. Psicain is a white crystalline powder, soluble in four parts of water, giving a solution with a faintly acid reaction. The aqueous solution will bear heating to 110° C. for sterilisation purposes, without decomposition. The most valuable feature of the new synthetic product is the absence of any tendency to produce euphoria, which has secured for cocaine its unenviable reputation in the public mind. Another useful feature is that its effects last for a much shorter time than those of natural cocaine, detoxication taking place much more rapidly. If the preliminary results are confirmed this will be a marked triumph for chemical research, and, as our contemporary, *The Chemist and Druggist*, suggests, it may lead eventually to the possibility of prohibiting the manufacture of natural cocaine in the international interests of the suppression of the "drug habit."